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NEWS

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architectural & engineering
NEWS

Cover design by Tony Palladino, who joins the staff of Architectural & Engineering News in wishing our readers a Merry Christmas and a Happy New Year.

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GAZETTE

Dr. William Winfield Walton has recently been appointed Chief of the Organic Building Materials Section of the Building Research Division at the National Bureau of Standards. Dr. Walton transferred from his position as Chief of Surface Chemistry Section of the Chemistry Division, and succeeded Dr. H. R. Snoke, who recently retired.

Dr. Samuel Steingiser, Assistant Director of Research, Mobay Chemical Co., New Martinsville, W. Va., and Edwin A. Edberg, Dylite Foam Department, Koppers Co., Inc., Monaca, Pa., have been re-elected Chairman and Vice-Chairman, respectively, of the Cellular Plastics Division of The Society of the Plastics Industry, Inc. They will serve for the next two years.

Walter P. Green has been named Vice President of Administration of Engineers Incorporated, Newark, N. J. He was formerly Vice President and Chief Engineer. In his new post, Mr. Green will direct all phases of administration as it relates to contracts with clients served by the firm.

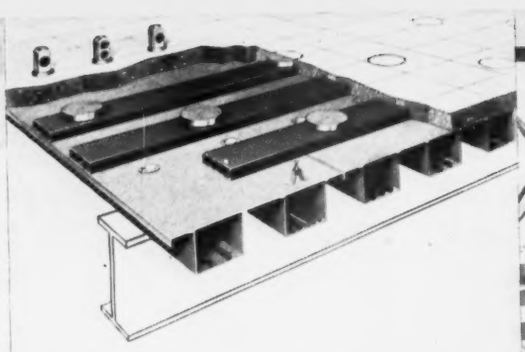
James M. Straub, President of Fort Pitt Bridge Works, Pittsburgh, Pa., was elected President of the American Institute of Steel Construction, national association representing the fabricated structural steel industry, at its 38th annual convention.

Professor Harry E. Rodman, professor of architecture and executive officer of the School of Architecture at Rensselaer Polytechnic Institute, has been named Vice Chairman of the New York State Board of Examiners of Architects.

B. Sumner Gruzen, FAIA, a principal in the architectural-engineering firm of Kelly & Gruzen, has been named co-chairman of the 1960 New York Muscular Dystrophy drive.

The following women were elected at the June biennial Convention of the Association of Women in Architecture—Alpha Alpha Gamma—to serve as National Officers for July 1, 1960 to July 1, 1962: President, Mrs. Edward Silberman, Minneapolis, Minn.; Vice President, Mrs. Remus N. Bretoi, St. Paul, Minn.; Secretary, Miss Evelyn Sandry, Minneapolis, Minn.; Treasurer, Mrs. Dorothy K. Hunt, St. Paul, Minn.; Historian, Miss Betty Lou Custer, St. Louis, Mo.; Editor, Mrs. Fred W. Drosten, Chattanooga, Tenn.

Knowlton Fernald, Jr., AIA, has joined the Santa Ana, Calif., staff of Cabot, Cabot & Forbes, Inc., as coordinator of architecture. Fernald, associated with the architectural firm of Schwager, Fernald and Ballew, Newport Beach, is treasurer of the Orange County Chapter of the American Institute of Architects.



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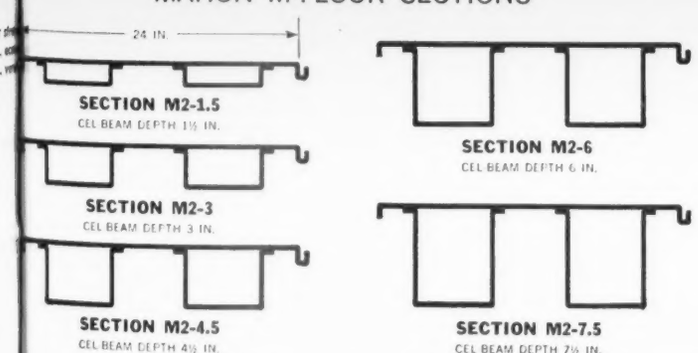

Note: These M-Floor Sections are also available with cell elements having integral stiffening ribs for improved section properties.

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GAZETTE

The firm of Freidin, Studley Associates of New York City, architectural, design, and office planning consultants, has announced the appointment of Sanford Kaufman as Director of Planning and Development.

Robert T. Dormer, former deputy regional director of Urban Renewal Administration (Region 1), has been named Director of the Urban Renewal Division of Victor Gruen Associates, New York, Chicago, and Los Angeles.

Leonard L. Hunter of the Washington-Metropolitan Chapter, AIA, received a Meritorius Service Award from General Services Administration. Hunter is Assistant Commissioner for Design and Construction of GSA's Public Buildings Service.

St. Louis Chapter, AIA, member George E. Kassabaum is a member of the Missouri Committee for the 1961 White House Conference on Aging, and as chairman of its task force on housing, led a workshop at the state meeting in July.

George F. Pierce, Jr., Houston Chapter, AIA, was elected Chairman of the Board of the Contemporary Arts Assn. of Houston.

Bergman S. Letzler of the West Kentucky Chapter, AIA, has been elected president of the Arts Club of Louisville.

Charles O. Matcham of the Southern California Chapter, AIA, has been appointed to a third term on the Board of Governors of the Los Angeles County Museum.

Recipient of an Honorary Doctor of Fine Arts from Washington College in Maryland was Henry Powell Hopkins of the Baltimore Chapter, AIA.

Sewell J. Mather of the Minneapolis Chapter, AIA, has been re-elected chairman of the Commission on Architecture of the Lutheran Society for Worship, Music and the Arts.

office announcements

The Hagan Publishing Corp. announces the new headquarters and editorial offices of ARCHITECTURAL & ENGINEERING NEWS at 500 Bloomfield Ave., Montclair, New Jersey.

Michigan Associates, consulting engineers of Lansing, Mich., announce the firm name change to John R. Snell Engineers, Inc.

Announcement of the addition of a new partner and the subsequent incorporation as Scharfenberg, Polivka and Gale, has been announced by the Minneapolis industrial design firm. The new member of the firm is John A. Gale, who had been head of his own design studio. Previous to that, he was Vice President of Charles Butler & Associates.

DRAFTING TRENDS

In a typical application of the POST Diazo Materials Selector Chart, a draftsman, supervisor and reproduction specialist solve a special print-making problem in short order.

Solve unusual reproduction problems with new Diazo Selector Chart

Keeping up with rapid developments in graphic reproduction and communication techniques is a difficult job these days, even for the experts.

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The new POST Diazo Materials Selector Chart does just that—provides a condensed, tabular reference piece that helps you anticipate the ideal diazotype prints for various needs before they occur. This convenient chart gives brief information on sensitized papers, intermediates and specialties in terse "what, when, why and where" style.

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FORECAST

CONSTRUCTION OUTLOOK: FIRST TEN MONTHS 1960*

The value of total new construction put-in-place in October 1960 amounted to $5.1 billion, according to preliminary estimates of the Bureau of the Census, U. S. Department of Commerce. This amount was 3 per cent less than in September 1960—a normal seasonal change—and about the same as in October 1959. The value of total new construction expenditures in the first ten months of 1960 was $45.9 billion, 2 per cent less than the total for the first ten months of 1959. It should be noted, in making comparisons with data for 1959, that the estimates for the latter months of 1959 (beginning with September) reflect the effects of steel shortages resulting from the 1959 steel strike.

Private construction

Total new private construction expenditures in October 1960 amounted to $315 billion. This was 2 per cent less than in September 1960 and 4 per cent below the level of October 1959. Spending for construction of private nonfarm residential buildings in October 1960 amounted to $1.9 billion, 5 per cent less than in September 1960 and 15 per cent less than in October 1959.

The seasonally adjusted annual rate of spending for all private construction in October 1960 was $38.3 billion, 1 per cent below the September 1960 rate. For private nonfarm residential buildings, the October 1960 rate was $20.9 billion, a 4 per cent decline from the September 1960 rate.

In the first ten months of 1960, the cumulative value of total private expenditures was $32.5 billion, compared to $33.1 billion in the same period of 1959. The cumulative value of private nonfarm residential expenditures in the first ten months of 1960 was $18.4 billion, 10 per cent less than the $20.5 billion spent in the comparable period of 1959.

Public construction

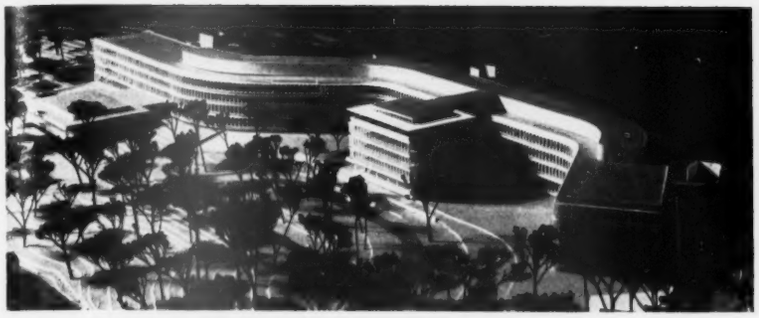
Spending for all public construction in October 1960 decreased by less than the normal seasonal change from September to $1.6 billion. This amount was 4 per cent less than in September 1960 but 12 per cent more than in October 1959. The October 1960 seasonally adjusted annual rate of total public construction was $16.7 billion, an increase of 2 per cent over the annual rate in September 1960. The cumulative value of public construction expenditures in the first ten months of 1960 was $13.5 billion, 3 per cent below the total for the first ten months of 1959.

Technical note

Estimates for the latter months of 1959 reflect the results of special surveys of a sample of builders and contractors undertaken, in September, October, and November 1959, to obtain information about the effect that steel shortages had on construction work done in those months. Results of the surveys were applied to the figures derived from the normal estimating procedures and estimates were made of the effects of continuing shortages of steel for several months beyond the end of the steel strike. In addition to the factors measured in the surveys, contracts for some construction projects were not awarded because of uncertainty about delivery of steel; the effect of this latter factor, though not measured in the special surveys, is reflected in the 1959 estimates through application of the standard estimating procedures.

Except when special surveys are undertaken, as was done during the 1959 steel strike to obtain some information about the effect of steel shortages on construciton work done, these monthly estimates are not based on direct measurements. Primarily, they are derived by applying standard progress patterns (which reflect normal seasonal movements) to the value of contracts awarded prior to the current month. However, in the case of new private dwelling units, patterns are applied to the estimated value of housing starts through the current month. The estimates do not reflect the effects of the varying number of working days in each month, nor of special conditions influencing the volume of activity in any given month, such as unusual weather, overtime, postponements, and except when special surveys are made, materials shortages and work stoppages.

**Based on "Construction Reports," U. S. Department of Commerce, Washington, D. C.*



Design of the award winning American Cyanamid Co. building is marked by its long, curving shape which was inspired by the contours of the site overlooking property soon to be flooded to create a reservoir. The single-building plan meets the company's requirements for maximum flexibility in arranging office spaces, while the serpentine shape avoids repetitious vistas for the workers inside. A 600-seat cafeteria and a four-story executive wing extends from the east side of the building. Architect: Vincent G. Kling, FAIA, Philadelphia.

Preliminary plans have been approved for new dormitories and mess hall facilities for the only state maritime college in the nation, State University Maritime College, at Fort Schuyler, N.Y. This $3,110,000 project will enable the college to increase its enrollment from the present 374 to 600 students. Architects: Ballard, Todd and Snibbe, New York.

LEFT. Plans for a 22-story, $15,000,000 office building for Chicago's Loop have been announced by Continental Companies. The structure features 42-foot horizontal steel spans along the four sides of the building. Architects: Naess and Murphy, Chicago.

BELOW. Elevated view of Canton, Ohio, City Hall shows building arrangement and inner, "Memorial Court." The $3.5 million structure calls for approximately 25 tons of stainless steel. Occupancy for the eight-story building is scheduled for March, 1961. Architects: Kelly and Gruzen, New York.

Architect's rendering showing Brown University's new Physical Sciences-Engineering Center at the University's Providence, R.I. campus. Picture shows Heavy Engineering Laboratory, left, the Engineering and Physics building, center, and its inter-connected Lecture Pavilion on the right. Architects: Sherwood, Mills and Smith, Stamford, Conn.

A|E NEWS

AIA portfolio

Creation of a Reynolds Aluminum Prize for Architectural Students, with a top award of $5,000 to be divided equally between the winning student and his school, was announced by *The American Institute of Architects*. The prize will be administered by the AIA under a program sponsored by Reynolds Metals Co. Under the program a $200 prize will be awarded to the student in each participating college of architecture who submits the best original design for any type of building component in aluminum. Each school will handle its own judging in any way it chooses. Participants must be third year, fourth year or graduate students.

The winning design from each school of architecture will be judged by a jury of three distinguished architects chosen by the AIA.

For the initial year's program, each school must complete its judging by February 1, 1961, with winning designs to be submitted to the AIA by February 13, 1961, for the national competition. The national prize will be awarded at the AIA Student Convention in April 1961, Philadelphia.

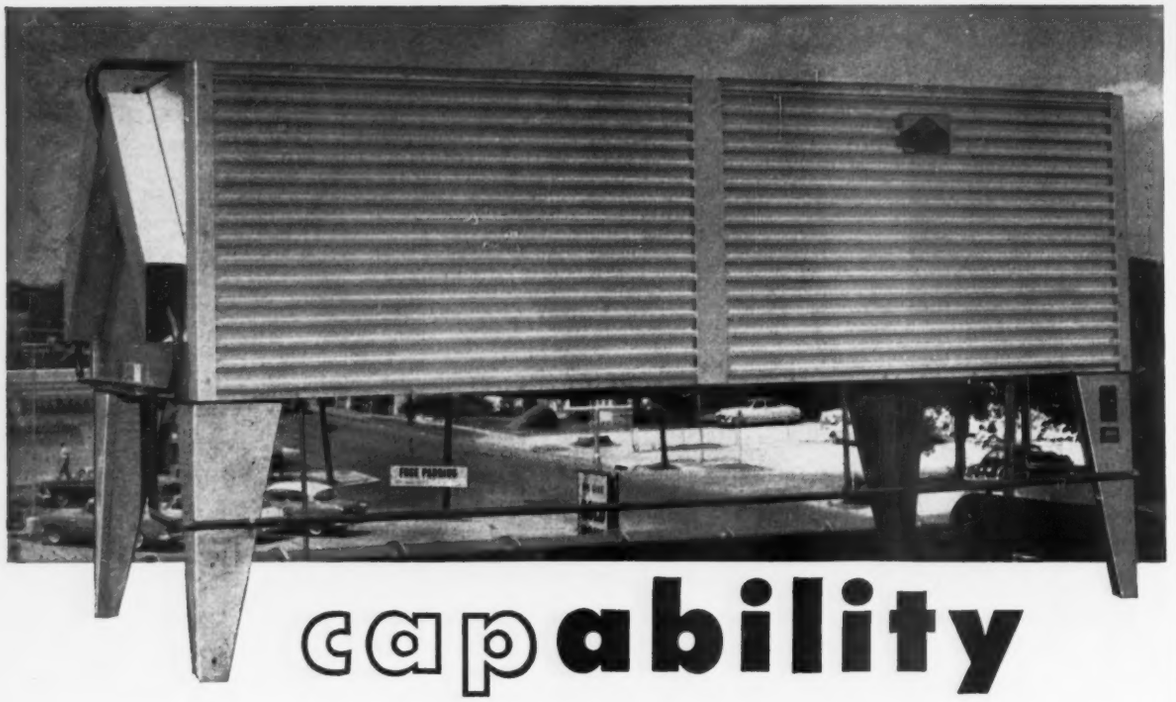
The *California Council, The American Institute of Architects*, describes its recently concluded 1960 CCAIA convention at Yosemite National Park as "one of the best." Over 800 architects, their wives and others associated with the profession attended the convention. The Hotel del Coronado will be the site of the California Council's 1961 convention, Executive Director Melton Ferris announced. Convention dates will be October 18-22 in this highly popular location. The CCAIA Board of Directors also selected the Monterey Peninsula as the site of the 1962 convention and has voted to pursue the feasibility of holding the 1963 convention in Mexico City.

The Medal of Honor for City Planning, given only three times since its establishment in 1939, has been awarded to Lawrence M. Orton, charter member of the New York City Planning Commission.

The medal, presented at a dinner meeting at Park Avenue's Sheraton-East Hotel, is jointly sponsored by the Metropolitan Section of the American Society of Civil Engineers, the New York Chapter of the American Society of Landscape Architects, and the Brooklyn and New York City Chapters of the American Institute of Architects. E. James Gambaro, FAIA, said the award is given "to those planners with vision, a capacity for service, men with broad horizons of interest and a proven ability to solve problems endless in their complexity."

In accepting the award, Mr. Orton pointed out that a "truly modern approach at the highest professional level is vital to the development of all American cities including the finer New York that we so devoutly seek. Toward this end I urge the formation of a joint commission of planners,

(Continued on page 6)



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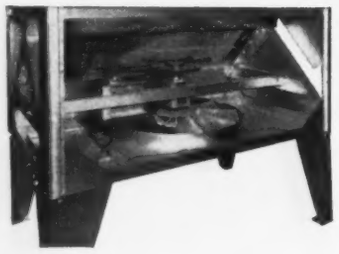

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A|E NEWS

(Continued from page 5)

architects, engineers and landscape architects to chart courses, establish professional principles and areas of responsibility."

Commissioner Orton declared that "in city planning the forces of disintegration and chaos are powerful." He said that "the special interest, the selfish lobby, the one-track mind, the demagogue whether in high places or seeking a purely local following, are always on hand and ready to disrupt, defer, sidetrack, or otherwise impair the positive forces I have outlined. We require constructive leadership in all these spheres of action."

NSPE/CEC notes

The National Society of Professional Engineers, in surveying engineering employment practices, reports that over 51 per cent of companies recently surveyed by the American Management Assn. compensate one or more groups of their salaried employees in some way for overtime work, but only 32 per cent give such compensation to their salaried professionals.

Of the 434 companies replying, 147 report that salaried professionals receive some form of overtime compensation. Straight time was the most popular form of compensation, receiving 53 mentions. Next most popular was time-and-a-half, mentioned on 34 replies, followed by the two-rate system (usually time-and-a-half up to a certain salary level, and straight time or less after that) used by 19 per cent.

Thirteen companies use a sliding scale which decreases as higher salary levels are reached, with no overtime compensation at all being the rule above the $12,000 mark. The fuller report of the survey, *Overtime Compensation for Exempt Employees*, is available for $2.25 from the American Management Assn., 1515 Broadway, New York 36, N.Y.

The semi-annual convention of the *Consulting Engineers Council* held last month at Pittsburgh was stated to be one of the most comprehensive held by that organization to date. The agenda of the meeting featured such subjects as corporate practice, competitive bidding, CEC's private enterprise program, public relations, contract documents, inter-professional relations and the formal issuance of informational guides to methods of practice and brochure presentation.

study of shop drawing practices

This study of shop drawing practices has been released for publication by this magazine by the Office Practice Committee of the New York Chapter of The American Institute of Architects. This article constitutes Appendix B of the Annual Report of the Office Practice Committee, Samuel M. Kurtz, AIA, Chairman. It is hoped that this study may prove a useful guide for other architects throughout the nation.

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1. Introduction
2. Definition
3. Purpose of shop drawings
4. Necessity of shop drawings
5. Value of shop drawings
6. Architect's obligations
7. Contractor's obligations
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13. Return of shop drawings without checking
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20. General comment

Appendix A: shop drawing approval stamp
Appendix B: shop drawing record form
Appendix C: specifications for transparency method

1. Introduction

The preparation of shop drawings by the prime contractor, his subcontractors and vendors, based upon the plans and specifications prepared by the architect and engineer, is an accepted standard practice. Essential when the contract drawings and specifications, for valid reasons, are insufficiently detailed, they are also necessary in most other cases to enable the architect to determine whether the contract requirements will be met. This practice has been abused at times by the preparation of incomplete design drawings, and placing excessive reliance on the shop drawings to bring about the desired or intended results; and on the other hand by the contractor's use of this medium to avoid some of his responsibilities by having the architect and engineer perform a great deal of work that is the contractor's obligation.

Despite the fact that shop drawings are a common procedure, many questions occur that require definition. They include, for example, what should be submitted, method of submission, extent to which they should be checked and by whom (architect and/or contractor); the responsibility and liability the architect incurs by such checking and his authority for making changes.

In this study the Office Practice Committee has considered these factors and has indicated what it considers to be the best way to perform and control this important phase of an architect's work.

2. Definition

The term *shop drawings* is generally considered to include: fabrication, erection and setting drawings; manufacturer's standard drawings; schedules; descriptive literature, catalogs, brochures; performance and test data; wiring and control diagrams; and all other descriptive data pertaining to materials, equipment and methods of construction as may be required to show that the equipment or materials and the position thereof conforms to the contract requirements. As used herein, the term *manufactured* applies to standard units usually mass produced; and *fabricated* covers items specifically assembled or made out of standard materials to meet individual design requirements.

3. Purpose of shop drawings

The prime contractor is required to submit shop drawings to confirm the intent of the plans and specifications, and for his own use in coordination. They furnish the means by which the materials, equipment, methods of fabrication and assembly, and connection with contiguous work, worked out by his subcontractors, can be checked by the prime contractor for coordination and compliance with the contract, and then submitted to the architect for verification and approval.

4. Necessity of shop drawings

There usually are several manufacturers and fabricators who make or assemble acceptable competitive items similar to those shown or specified. It is thus often possible to serve the owner's interests best by permitting competition from several suppliers for comparable items. Government regulations are mandatory in this respect.

It is a practical impossibility for the architect to indicate in his design the construction details which would be applicable to all known manufacturers. Thus the shop drawings permit the architect to determine final acceptability on the basis of design and construction.

5. Value of shop drawings

Shop drawings establish the actual detail of all manufactured or fabricated items; indicate proper relation to adjoining work; amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure; and enable minor changes of design or construction to be made to suit actual conditions which could not be foreseen. They prevent misinterpretations and misunderstandings in the completed work which could not be accomplished in any other manner. It is felt that if uniform practices regarding shop drawings were established, they would clarify the functions and responsibilities of everyone concerned beyond question or dispute.

6. Architect's obligations

The architect's responsibilities regarding shop drawings are defined by Article 5 of the AIA General Conditions as follows: ". . . , and the Architect shall pass upon them with reasonable promptness, making desired corrections, including all necessary corrections relating to artistic effect."; and are limited by the following wording: "The Architect's approval of such drawings or schedules shall not relieve the Contractor from responsibility for deviations from drawings or specifications, unless he has in writing, called the Architect's attention to such deviations at the time of submission, nor shall it relieve him from responsibility for errors of any sort in shop drawings or schedules." Present construction practice has tended to negate the intent of the above Article.

It is necessary that this concept be reinforced and reiterated to prevent misunderstandings which arise in cases where errors, omissions, and contract deviations have been made on the shop drawings

(Continued on page 8)

SHOP DRAWING PRACTICES

(Continued from page 7)

which the architect has overlooked and inadvertently *approved.*

The prime contractor must back-check all corrections made by the architect to be certain that the contractor has not avoided his responsibility as defined in Article 5 of the General Conditions. The wording makes it clear he cannot shift this responsibility to the architect.

The architect, of course, is presumed to know the contract requirements and must guard against asking for more than they stipulate. His responsibilities include the dual function as agent of the owner and the judge of the contractor's compliance with drawings and specifications. He should scrupulously avoid the possibility of incurring extra cost by making greater demands than the owner is entitled to enjoy under the contract, and should raise and settle the question of change in cost whenever he makes or approves changes on shop drawings.

It is important for the architect to keep in mind that when there are several prime contractors on a project, any changes proposed on the shop drawings by any one of them, may materially affect the work of the other prime contractors.

7. Contractor's obligations

The contractor's responsibilities with regard to shop drawings are defined in Article 5 of the 1958 edition of the A.I.A. General Conditions as follows:

"The contractor shall check and verify all field dimensions and shall submit, with such promptness as to cause no delay in his own work or in that of any other contractor, three (3) copies, checked and approved by him, of all shop or setting drawings and schedules required for the work of the various trades, and the architect shall pass upon them with reasonable promptness, making desired corrections, including all necessary corrections relating to artistic effect. The contractor shall make any corrections required by the architect, file with him two corrected copies, and furnish such other copies as may be needed."

These general requirements are usually modified in the special or supplementary general conditions, and in individual trade sections of the specifications to meet special requirements.

The phase *reasonable promptness* has too often been used by prime contractors as a means to make the architect the scape goat for his own delays. The familiar procedure is to hold up submission of such drawings until needed immediately in the progress of the job. They are then issued to the architect all at once and he is pressed for immediate approval. Obviously this method does not allow the architect sufficient time to make a proper check of the drawings and results in accusations of *delays by the architect.*

It is the contractor's obligation, as well as his responsibility, to organize the procurement of manufactured and fabricated materials and items so that they are available at the time they are needed in the work. This can only be accomplished by proper scheduling of every phase of the construction procedure, including preparation, submission and checking, and resubmission of shop drawings. Many architect offices require from five to ten working days to process a shop drawing, and in order to insure that they are allowed this time, it has become a practice to insert a definition of the phrase *reasonable promptness* in the specifications.

Article 3 of the A.I.A. General Conditions requires the contractor to submit a progress schedule indicating the dates for starting and completing the various stages of construction. Shop drawings are a *stage of construction.* Such schedule should include adequate time for processing and checking of shop drawings, and should be approved by the architect as required by this article. Too many contractors seem to feel that having submitted the shop drawing —no matter when—they have fulfilled their obligations.

The prime contractor must assume full responsibility for the shop drawings submitted by him for his subcontractors or vendors. The execution of the work in the contract is his sole responsibility. He is not acting as an agent or a broker. He must assure himself that his subcontractor is meeting the contract requirements, before passing the shop drawings on to the architect. It is as much a reflection on the prime contractor as it is on his subcontractor if shop drawings presented to the architect propose inferior materials or methods. In an effort to enforce this obligation of the contractor, it is important to note that Article 5 of the A.I.A. General Conditions now requires the general contractor to *check and appove all shop drawings* prior to submission to architect. When such checking has obviously not been done, or done superficially, architects are within their rights not to recognize them as a submission at all, and to return them unchecked.

Every shop drawing involves the contractual obligation of the prime contractor. Items left out by the subcontractor automatically must be furnished by the prime contractor. It is not the duty of the architect to protect the prime contractor against his subs. He must do this himself.

When the shop drawings indicate changes which may be acceptable to the architect, it is essential for the contractor to determine whether such changes will affect a correlated function, construction, or the work of other contractors, before they are submitted to the architect for approval. For example, acceptance of an elevator of different manufacture, or one make of roof fan over another, could affect structural design. This can occur after the structural elements are in place. There are many similar examples. In such cases the contractor must make it clear that he will assume the cost of all other related changes before the architect can be expected to indicate his approval.

At times, corrections to shop drawings by the architect may inadvertently become justification for a claim for extra cost. Article 16 of the A.I.A. General Conditions requires that any claims for extra cost must be in writing within a reasonable time after receipt of instructions, and before proceeding with the work. Obviously, the contractor should recheck the shop drawings returned by the architect for his own protection.

8. The approval stamp

The New York Building Congress in its recent study made on shop drawings has recommended that the approval stamp be either *approved, disapproved,* or *approved as noted;* and when *approved as noted,* that no resubmission be required.

Actual practice indicates that it is more practical to require resubmission of *approved as noted* shop drawings. Approval of most shop drawings is in this category. It is unfair to delay manufacture by marking them disapproved in order to obtain resubmission. Many manufacturers or fabricators will not, as a matter of policy, commence fabrication unless *clean* approval is obtained. The architect must often be certain that the corrections he has made, even if minor, have been incorporated on the shop drawings. However, it should be optional with the architect.

It should be clear from the general conditions that the architect's approval of a shop drawing is not a guarantee that all items required have been included; he cannot be responsible for errors or for omissions. Shop drawings are sometimes submitted for approval of a part of the work in a given trade. He can only check what he is given to check.

The approval stamp should contain wording to the effect that: approval is subject to all contract requirements; is for design only; is subject to coordination with all other trades; is not for quantities; does not include or authorize *extra* work; does not guarantee dimensions; and does not include major changes to contract requirements unless specifically covered by a separate letter of authorization. *(See Appendix A: page 14.)*

9. Grading of shop drawing corrections

The difference between various types of qualified approvals and disapprovals is often measured by the attitude of the checker. An *approved as noted* by one checker may be a *disapproved* by another. There should be a uniform method of grading:

a. *Approved:* No corrections, no marks.

b. *Approved as noted:* Minor amount of corrections; all items can be fabricated without further correction; checking is complete and all corrections are obvious without ambiguity.

c. *Approved as noted—resubmit:* Minor amount of corrections; noted items must *not* be fabricated without further correction; checking is *not* complete; details of items noted by checker are to be further clarified before full approval can be given; items *not noted* to be corrected *can be fabricated* under this stamp. Note: Where the architect wishes to withhold fabrication of the items not marked, he should note the drawing: *Hold up all fabrication until further notice.*

d. *Disapproved:* Drawing is rejected as not in accordance with the contract, too many corrections, or other justifiable reason. When returning the drawing to the contractor, the architect should state his reasons for the rejection. The drawing must be corrected and resubmitted. No items are to be fabricated under this stamp.

The explanations listed above should be made a part of the specifications.

10. Fabrication on "approved as noted"

The contractor should be allowed to fabricate on *approved as noted,* if this will expedite the project completion date, provided that the contractor adheres to the corrections noted.

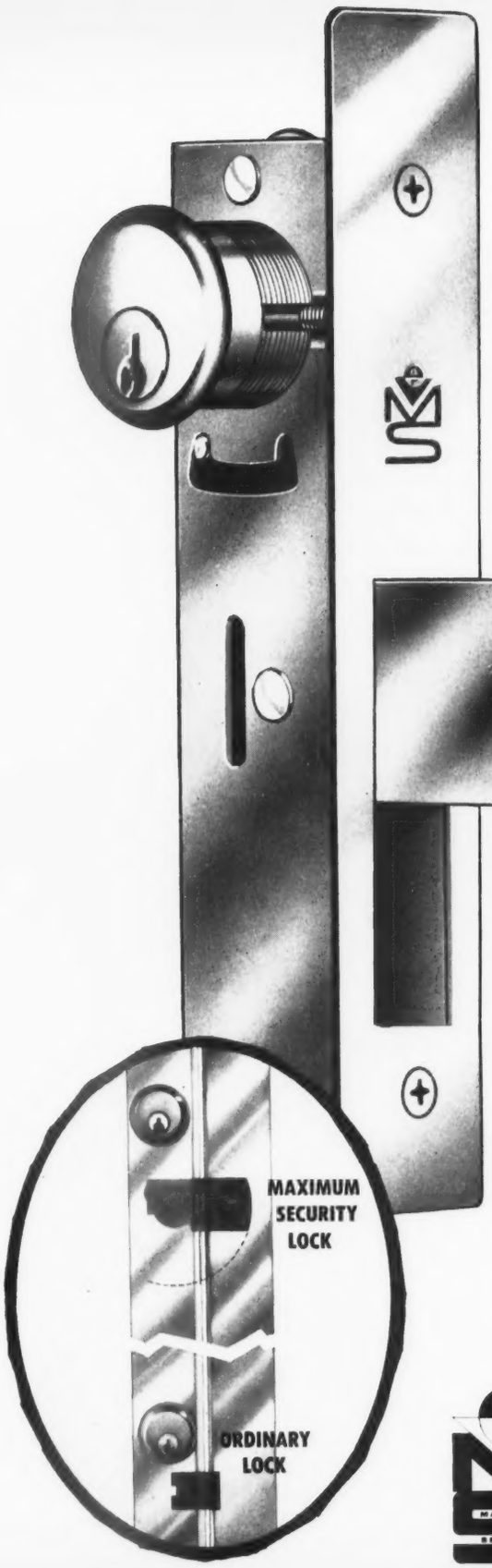
If fabrication is not made strictly in accordance with the corrections noted, the item should be rejected in the field and the contractor should be required to remove the item and refabricate in accordance with the corrected shop drawing. As a matter of record, contractor should be required to furnish copies of shop drawings which were *approved as noted* after corrections have been made.

11. Partial approvals

To expedite construction, the architect should process and approve shop drawings as quickly as possible. On occasion when parts of shop drawings can be approved and the remaining parts cannot, the architect could allow the contractor to fabricate the acceptable items as soon as he wishes.

(Continued on page 13)

Circle 105 for further information about AMERICAN BRIDGE DIV., pp 10-11 →



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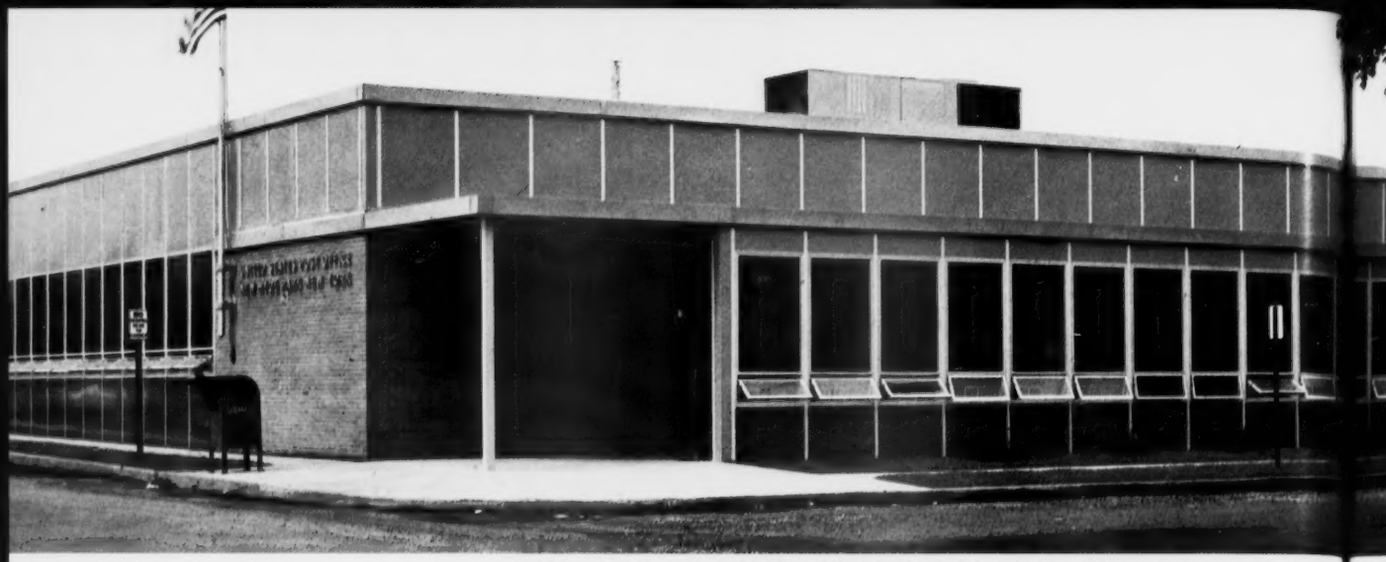

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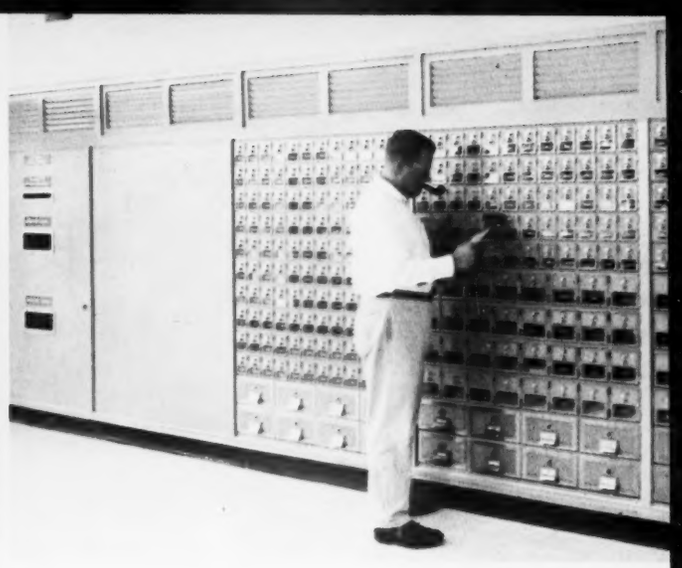

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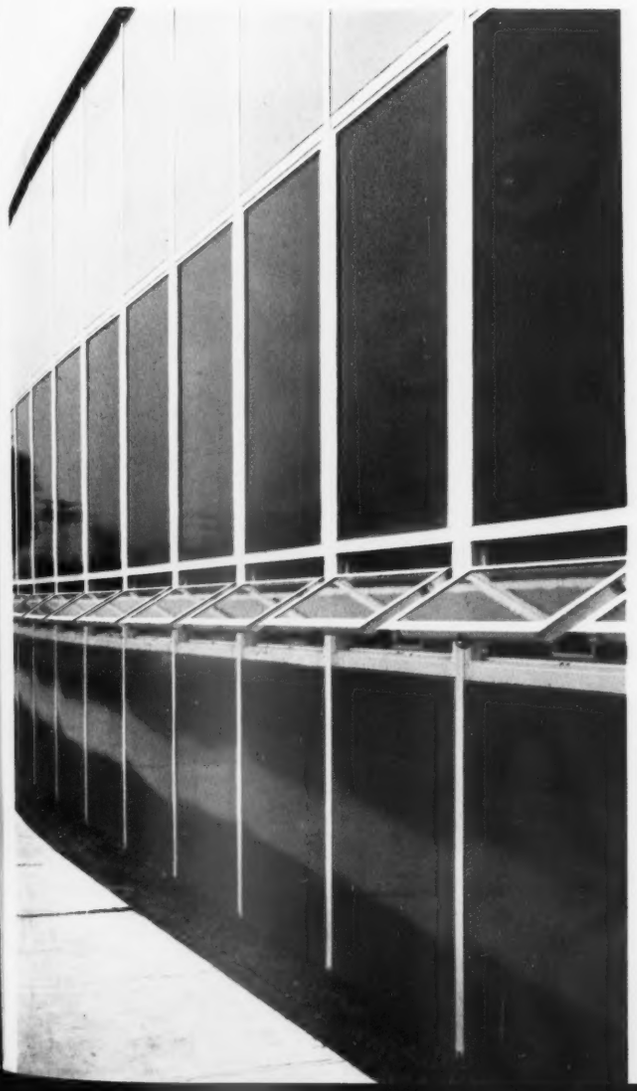

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SHOP DRAWING PRACTICES

(Continued from page 8)

The architect will not lose control of a shop drawing he approved in part if the inadequate or unacceptable portion is circled and an appropriate note stating its rejection placed adjacent to it. Then the entire drawing may be stamped *approved as noted—resubmission is required*, which would allow fabrication of the portions accepted and approved by the architect.

12. Resubmission of corrected drawings

Where an architect has corrected a shop drawing and requested a resubmission, only those corrections noted by him must be made to the shop drawing.

In many instances, the contractor makes a change to the resubmitted shop drawing in excess of that requested by the architect. The architect relies on his previous corrections to check the resubmitted drawing, thereby overlooking the new changes made by the contractor.

To prevent the above from occurring, the specifications should include a statement to the effect that no changes are to be made by the contractor to resubmitted shop drawings in excess of those corrections noted by the architect unless the drawing is accompanied by a separate notice from the contractor, or in some other way brought to the attention of the architect.

13. Return of shop drawings without checking

Shop drawings should be returned to the contractor without checking when they are submitted in violation of specified procedure, or inadequately checked by the contractor, or inaccurate and in substantial error.

Drawings thus returned to the contractor should be accompanied by a letter to the effect that the drawings are to be checked by the contractor in accordance with the terms of the contract, and that *they are not being considered as an official submission.*

14. Problem of "by others"

The words *by others* on a shop drawing should have only one meaning to an architect, and that is that the item is not being included as a part of the construction contract. Where these words are shown, the architect should circle the wording and request a definite answer as to who will furnish the item. To avoid delay, the architect could strike out the words *by others* and write *by prime contractor* instead. This problem may be eliminated when the prime contractor checks the shop drawing and indicates who will furnish the questioned item.

The architect who approves the shop drawing with the words *by others* in the belief that the contractor is responsible for the complete building and he must eventually furnish the item, may later become involved in litigation to determine whether or not the item was deleted from the contract by the architect's approval of the shop drawing with his acceptance of the words *by others.*

15. Architect's retention for future checking

The architect may be obliged to hold shop drawings in cases where partial submissions cannot be checked until the complete submission has been received, or where shop drawings cannot be checked until correlated items affected by them have been received.

When such shop drawings are held up by the architect, he should so advise the contractor in writing, with the statement that the drawings submitted will not be checked until all parts of the particular item have been received, and that they will not be considered a formal submission until such time as the submission is complete in every respect.

16. Field copy

The contractor should be required to keep one copy of each approved shop drawing on file at the project site for use by his own staff or architect's or owner's representatives. A clause to that effect should be inserted in the specifications.

17. Recommended contents of shop drawings

Shop drawings should contain the following information:

a. Job title and shop drawing number.
b. Date and dates of revisions.
c. Contractor's certification that shop drawing has been checked by him for compliance with contract documents.
d. Space for approval stamps.
e. Details of fabrication, assembly and erection.
f. Materials used.
g. All required dimensions.
h. Details of connection with contiguous work.
i. Information on all items of equipment.
j. Who furnishes related work (usually noted *by others*).
k. Complete schedules.
l. All protective coatings and factory finishes.

18. Control of shop drawings

The importance of shop drawings in the progress of the work is fairly obvious. Thus, the timing of the preparation, submission, checking and finally fabrication of the items covered by the drawings, materially affect the over-all construction schedule.

It is necessary therefore that accurate records be kept of the status of the work. Contractors submit shop drawings with a dated transmittal form. Architects should also use a transmittal form when the drawings are issued to consultants for checking, and when they are returned to the contractor.

In order to keep a running record of the status of shop drawings, the architect should keep a log by trades in which he records: name of contractor or subcontractor making submission; shop drawing number and title; number of copies received; date received; distribution to named consultants, number of copies and date; return from named consultants, number of copies and date; space for recording resubmission; action taken, date, and date returned to contractor.

Many specifications list the shop drawings that are required by trade and by specific items. Such a list should be incorporated in the construction progress schedule submitted by the contractor for approval.

When delays occur they are not overcome by pinpointing who is to blame. It is therefore mandatory for the general contractor to enforce the timing set up in the schedule, and advisable for the architect to remind the contractor when it is not being followed. This should prevent last minute rushes on preparation, submission and checking of shop drawings, with great possibilities for error and omissions, and general unpleasantness that results. *(See Appendix B: page 14.)*

19. New methods—transparencies

The New York Building Congress in its recent study of shop drawings recommended the transparency method. This procedure has considerable merit and has been tried in several offices in the New York Chapter area with marked success.

With this method, the contractor submits shop drawings on a reproducible print. The architect makes his corrections on this print. For structural framing and details it has been found desirable to require the submission of a conventional print with the transparency; this facilitates the minute check of every framing member that the engineer must make. He then marks only the corrections on the transparency.

A print of the transparency with its corrections is made by the architect and the consulting engineers for their records before it is returned to the contractor. Corrections are made by the contractor on the original shop drawing tracing and a new transparency is resubmitted.

The advantages of this procedure are:

a. Errors due to copying corrections on duplicate prints are eliminated.
b. More of architect's time is available for checking instead of duplicating notes.
c. Contractor saves cost of printing multiple copies for each submission; only the final approved transparency is duplicated for distribution.

Some of the problems that have been experienced with this shop drawing procedure, due principally to its newness, are:

a. Contractor will ignore specifications and submit conventional prints. These should be returned to the contractor, requesting submission of a transparency.
b. Prints with a note *transparency follows* should not be accepted. The time spent transferring corrections from the conventional print to the transparency offsets the benefits to be derived.
c. There is a tendency to view the transparency as a tracing, or original drawing. Corrections should not be too carefully drawn. The checker should be required to treat the transparency the same way he would a conventional print; he should be told that they can be folded for mailing purposes.

A space should be provided on the shop drawings of at least 80 square inches for receiving stamp and approval stamp. This space may be within or outside the borders of the drawing. It should always be at the right hand side for uniformity throughout the industry. This could be required by the specifications.

Transparencies should not be required for equipment brochures, cuts of fixtures, etc., which are better submitted in conventional fashion in the number of copies required. *(See Appendix C: suggested specification, page 14.)*

20. General comment

Broadly speaking, the practice of submitting shop drawings for every conceivable item is being overdone. The subject deserves further study along these lines.

For example, architect's drawings and specifications usually cover the subject of doors, door frames and hardware very thoroughly and carefully. It should only be necessary for the architect to check the door and frame types as to design and construction, and the hardware specifications or schedules. The door and frame type, and its size and swing are shown; it could be said *must* be shown on the drawings. Then why is it necessary to submit full schedules listing every single door, its location, size, type, swing, partition thickness, saddle, distance of buck above and below the floor, and anything else the contractor can think of? This is an unnecessary burden on the architect. *(Continued on page 14)*

← Circle 105 for further information about AMERICAN BRIDGE DIV. pp 10-11

SHOP DRAWING PRACTICES

(Continued from page 13)

Name of Architect

Address

APPROVED

DISAPPROVED

APPROVED AS NOTED

Resubmission (is) Required
(is not) Required

Checked by .....

Date .....

Approval is for design only. Contractor is responsible for dimensions, quantities and coordination with other trades. Approval does not authorize changes to contract requirement unless stated in separate letter or change order.
Corrected "Approved as Noted" drawing must be furnished.

APPENDIX A: Example of shop drawing approval stamp. Architect strikes out words that do not apply.

Appendix C:
SUGGESTED SPECIFICATION FOR USE IN CONNECTION WITH TRANSPARENCY METHOD OF SUBMITTING SHOP DRAWINGS—It is suggested that General Conditions provisions relating to shop drawings be amended to cover the following points when the *transparency* method of submission is required:

"Submit (state quantity) copies of standard manufactured items, in the form of manufacturer's catalog sheets, showing illustrated cuts of the item to be furnished, scale details, sizes, dimensions, performance characteristics, capacities, wiring diagrams and controls and all other pertinent information. One copy of approved and/or disapproved submissions will be returned to the contractor.

"For all other shop drawings, submit one (1) reproducible transparency of each drawing until final approval is obtained. Each drawing shall have a clear space of approximately 4 inches by 20 inches (either on the original tracing or as an additional border on the right hand side of the transparency print) for stamps—*date received; approved; approved as noted; disapproved; resubmit.* In the case of shop drawings for reinforcing steel, structural framing plans and details of structural members, in addition to the transparency print, a blueprint or black and white print of each transparency shall also be submitted.

"The approval of shop drawings by the architect will be general. It shall not relieve contractor of responsibility for accuracy of such shop drawings, nor for proper fitting, construction of work, furnishing of materials or work required by contract and not indicated on shop drawings. Shop drawing approval shall not be construed as approving departures from contract requirements.

"After completion of checking, the architect will obtain prints of the transparency for his record and will return the transparency to the contractor.

"Transparencies returned *resubmit* or *disapproved,* the original drawing shall be corrected, a new transparency reproduction made and resubmitted until final approval is obtained.

"Transparencies returned *approved* and/or *approved as noted,* the contractor shall obtain and provide such number of prints of the transparency as determined by the general contractor for field distribution, and one print for the architect's record."

An alternative clause covering cost of prints involved follows:

"All shop drawings for all trades and contracts shall be submitted for approval on transparencies; one transparency is required for each submission, until final approval is given. Each submission shall also contain a black and white print of the submitted transparency. The architects will annotate and correct the transparencies, and stamp them with indication of their action as appropriate. The architect will make two (2) prints of initial and subsequent submissions and five (5) prints of the final approved submission for distribution. All printing will be performed by the architect's regular printing concern at established rates. The contractor will be billed for these printing and mailing costs by the printer. These costs shall be included in the contract lump sum price for this building. The printing concern shall be considered as a subcontractor of each contractor for purposes of guaranteeing payment under the Payment Bond."

KIFF, COLEAN, VOSS & SOUDER ARCHITECTS THE OFFICE OF YORK & SAWYER	JOB																								
	TRADE																								
SHOP DRAWING RECORD	1st Submission							2nd Submission							3rd Submission							Status
	Received			Sent				Received			Sent				Received			Sent				
Submitted By	Dwg. No.	Drawing Title	From	Quan.	Date	To	Quan.	Date	Act.	From	Quan.	Date	To	Quan.	Date	Act.	From	Quan.	Date	To	Quan.	Date	Act.	
Key To Symbols	Firms	GC: Genl. Contr.			SC: Sub Contr.				SE: Struc. Eng.			ME: Mech. Eng.			EE: Elec. Eng.									
	Actions	D: Disapproved			A: Approved				AN: Appvd. as Noted			R: Appvd. as Noted—Resubmit												

APPENDIX B: SHOP DRAWING RECORD FORM

structural engineering in creative design

by Dr. Lev Zetlin *Dr. Zetlin is a Consulting Engineer in private practice in New York. He is also Visiting Professor, Department of Civil Engineering, Manhattan College.* *This article, based on the role of structural engineering in creative design, was originally given as an address to young architects. However, we believe its values are timeless and may be passed on by the professional to younger men in the field.*

It is difficult, and it is not my purpose, at this time, to define creative design. Each and everyone of you has possibly his own conception and definition of creative design. All these definitions may be different. In general, however, I presume that creative design implies design of a structure which is different from the conventional one and different from other structures already built. I don't want to cite some particular structure or a number of structures which conform to this sense of creative design; you are undoubtedly familiar with such structures.

Prerequisites and tools

I shall limit the discussion to the *prerequisites and the tools which make* "creative design" possible. Particularly the prerequisites and tools in structural engineering. For this purpose, let us look into the steps involved in any structural approach and design. These tools and the technical steps involved in structural design have not, in my opinion, been given sufficient attention and have not been brought home often enough to the architects, as have other aspects of structural engineering. *I believe that the awareness and appreciation* of the structural approach on the part of the architects—particularly on the part of young architects during their training—would assist greatly in the architectural design in general, and in creative design in particular.

Four steps in any structural design

There are four principal steps in any structural design. And here I would like to emphasize that these four steps hold in the investigation and design of any type of a structure without any limitation, be it any architectural structure, any other civil engineering structure, axle of a motor car, propeller of an airplane, warhead of a rocket, stability of the entire earthcrust, strength of a seashell, or of a spider web, or of a walnut shell—and, as a matter of fact, of anything we may possibly see around us in nature. All objects in nature have to withstand load, and therefore present, in principle, a structural problem.

The four steps are as follows:

1. Determination of a structural system (including the type of its structural material).

2. Determination of the external loads acting on the structure (including the reactions).

3. Determination of the internal destructive forces.

4. Design or investigation of the structure so that it is able to resist the internal destructive forces.

The first step is the most critical one. It is this step that is of paramount interest to the architects. And when we talk about creative design, it is this step that we have in mind. An architect in his planning is consciously, or subconsciously, tied to the structural system. Although within a given structural system, the architect has a variety of ways to finish a building—depending on his ingenuity—the structural system determines to a large extent success of an architectural project: its aesthetics, its functional adequacy and its economics. In all likelihood, the architect can come up with a better building if he is given more freedom in the choice of a structural system and if he has more flexibility and fewer limitations within a given structural system—such as elimination of beams, uneven spacing of columns, wide range of possible sizes of structural elements, etc.

Structural systems employed in the architectural design are relatively limited in number. Up until a couple of decades ago, they were essentially: beam and column (steel, concrete, timber), trusses and masonry arches and vaults. In recent years, new systems have been introduced: flat slabs (with mushrooms), flat plates (slab and columns, without mushrooms), shells and suspended roofs (hung from cables). However, counting all the existing structural systems, the possibilities of new ones have by no means been exhausted. Human imagination is still on the rampage. Structural systems that could be yet employed are unlimited. This is clearly exemplified by numerous structural systems in nature.

How can new systems be conceived

I am certain that the immediate question one would ask at this stage is: "How can the new workable structural systems be conceived?" And, "What are the attributes and prerequisites of architects and engineers to conceive new structural systems?"

In my mind these are two:

1. *Ideas.* Ingenuity and imagination to be able to conceive new ideas in general.

2. *Knowledge.* Thorough technical knowledge—gained by systematic study—to be able to perform the three remaining steps as outlined before.

No progress is possible without *both* of these two attributes. One goes with the other. And it is not sufficient to have only one of them for a real progress. It is my conviction, strengthened by experience, that the second item, i.e., knowledge, is the more important one. Without the "knowledge" to analyze a given structural system, however brightly conceived, the system cannot be employed. On the other hand, possession of a thorough knowledge and the subsequent experience gained from its use in structural analysis does give impetus to new ideas. The understanding of the behavior of a variety of structural systems and its component elements—namely, the behaviour of the destructive forces and the behaviour of the material in resisting them—does direct one's mind to the conception of new structural systems which can best serve a particular project or purpose.

Technical steps in structural engineering

Therefore, I shall try to give a bird's-eye view of the three technical steps which constitute the science of structural engineering.

Let me first illustrate all the four steps by a very simple example of a simply supported beam, with which all of you are undoubtedly familiar. The first step is to define that the structural system is a simply supported beam. Assuming that the beam is loaded by a concentrated force, we can compute the reactions. This is the second step. Knowing the loading to which the beam is subjected (including the reactions), we proceed to compute bending moment and shear force diagrams. These are the internal destructive forces, as required by the third step. Now comes the fourth step: to determine the dimensions of the beam, which can easily be done if we know the properties of the material from which the beam is constructed and its resistance to the destructive forces which were found in the third step.

In the most generalized approach, applicable to any structure, the four steps would involve the following respective specific items and quantities *(see the table, page 16, under the heading "type").*

It should be realized that the design of a structure—depending on its shape and the type of loading to which it is subjected—may involve all the items shown in the table, and thus may present quite a lengthy and a complicated process. The three steps are interdependent. To be able to design and to analyze such a structure, the engineer must possess adequate theoretical background, such as mathematics and applied mechanics, to arrive at the destructive forces; and he must have sufficient information about the properties of the material to correlate the destructive forces to the strength of the structure.

Let us see now how the various steps can be tackled. If every structure were analyzed thoroughly according to these steps beginning with the exact determination of the external loads, static and dynamic, followed by the computation of all the primary and secondary destructive forces as well as the investigation of stability (buckling), the structural design would consume a significant portion of the actual cost of the structure. Also, the engineering curriculum in colleges would need to be extended by a number of years.

Simplified method

In order to expedite structural design, various shortcuts and simplifications have been introduced in

(Continued on page 16)

STRUCTURAL ENGINEERING

(Continued from page 15)

every day structural engineering as applied to buildings. These simplifications appear in the theoretical tackling of engineering problems, both as taught in the undergraduate curriculum and as practiced in most of the engineering offices.

The main simplifications are as follows:

(a) All external loads (except own weight of the structure) are empirically reduced to an equivalent uniformly distributed load, called live load.

(b) The structural system in a building, which is actually three-dimensional, is assumed to be composed of a number of plane systems; these in turn are assumed to be composed of smaller members (slabs, beams, columns, connections, etc.). Thus, the design of the whole structural system is essentially reduced to the design of its component members, with little regard to their mutual interaction.

(c) Secondary destructive forces are disregarded. Buckling is not generally investigated and is taken care of by a number of empirical limitations imposed on the dimensions of the component members.

(d) Strength of a structural member is assumed to be governed by the resistance of some point inside the material which is being subjected to the largest stress by the primary destructive forces.

Going through these simplifications, one readily realizes that such an approach is only an approximation. And a design based on these approximations could be applicable only to those structures in which the approximations are kept within certain limits and where the disregarded secondary destructive forces are much smaller than the primary destructive forces.

To insure the safety of structures and to enforce a more or less unified design practice, building codes have almost universally been introduced. These codes are compiled on the assumption that the designers' approach would be based on the approximations as outlined. Various committees, which prepare these codes, make a thorough study of structures and eventually come up with design formulae, either for the live load or the allowable stresses, which take into account all the discrepancies that may occur in the simplified approach.

As progress is being made in the study of different structural systems, new systems are introduced into the code which can be handled by routine design. For example, within recent years, new systems such as flat slab and flat plate, have been incorporated in the ACI building code. Cylindrical concrete shells, although have not as yet appeared in any code, have already been prepared by ASCE in a form ready for routine design. Several codes take into account the continuity between the component members of a plane system. Design of a section based on the strength of the entire section, rather than on the strength of a point in the section, has now been introduced in the latest ACI code, published in 1956.

Limitations of the simplified approach are obvious. One is tied to structural systems which are covered by codes and whose structural behaviour does not deviate considerably from that assumed in the simplified analysis. A routine approach may be adequate for multi-story apartment and office buildings and possibly to some conventional industrial buildings.

Advanced method

The trend of modern architecture, however, is to depart from the conventional structural systems either in their entirety or at least in some parts of the buildings. In many cases this is justified from the economic, aesthetic and functional viewpoints of the project.

In these structures the simplified approach may prove to be unsafe or uneconomical. Because of the configuration of the structural members, the external loads cannot be treated as uniformly distributed live loads—the structure may be subjected to large unsymmetrical loads, or the dynamic loads may have very large effects which should be investigated independently of other loads. Secondary destructive forces may reach magnitudes much larger than the primary destructive forces.

Structures, or their components, of this type have to be analyzed more thoroughly, requiring more knowledge and ability on the part of structural engineers.

Structures which require accurate analysis increase gradually in their number due to the upsurge of modern architecture, and due to the progress in the science of structural engineering, which has been quite substantial in the last few years. This is particularly due to progress in the design of aircraft structures. I would like to stress that the accurate analysis, besides being essential for some structures, proves in many cases to be desirable even for conventional structures, since an accurate analysis usually results in a more economical structure, materialwise, than with conventional design.

At this stage you may be asking what an accurate analysis consists of. It is impossible, in this limited space, to cover all the methods of accurate structural analysis. I would like to point out, though, that today the science of structural engineering has reached a sufficiently advanced stage and that it is in a position to cope with almost any structural system one may conceive or notice in nature. The analysis may be lengthy and expensive, possibly impractical to be applied to a single structure, but the know-how is available.

Although we are not going to discuss the various methods of advanced analysis, I believe it is of considerable value to mention three factors in the advanced method of analysis and design which should be of interest to the architects. These three factors have a tremendous impact on structural engineering, and in a very short time they will undoubtedly enter into the routine design and into the building codes. These three factors, or let us call them concepts, are in fact the true representation of structural behaviour. They are:

STEP	TYPE	SIMPLIFIED METHOD	ADVANCED METHOD
1. Determination of a structural system (including the type of its structural material)	Almost unlimited	Post and beam; flat slabs; barrel shells	Unlimited
2. Determination of the external loads acting on the structure (including the reactions)	Own weight of the structure; actual weight of the superimposed loads; distortion loads (sinking of the foundation, temperature, shrinkage, etc.); dynamic loads and vibrations (impact of the superimposed loads, wind, earthquake, moving cars at a distance from the structure, etc.)	Dead load and live load	Have to compute actual external loads including dynamic effects
3. Determination of the internal destructive forces	a. Primary destructive forces: normal force (H), shear force (V), bending moment (M), torsion (T), and any combination of these	Only consider bending moment, normal and shear force; copy accepted design practice	Compute mathematically
	b. Secondary destructive forces: H, V, M, T, and any combination	Neglect	Compute mathematically
	c. Buckling	Empirical formulae applicable to simple cases	Compute mathematically
4. Design or investigation of the structure so that it is able to resist the internal destructive forces	a. Resistance to stresses at a point inside the loaded structure	Copy simple cases	Compute mathematically
	b. Resistance of the entire section through the loaded structure to the destructive forces acting on the section	Formulae limited to simple sections	Compute mathematically

STEPS IN ANY STRUCTURAL DESIGN

(a) Space action
(b) Limit design
(c) Plastic design of a section

Two of these concepts—space action and plastic design of a section, i.e., consideration of the strength of the entire section rather than that of a point—have already been mentioned above.

Limit design deserves a short discussion. The common way, both in the simplified and the advanced methods, to determine the internal destructive forces is by means of an elastic analysis. In this analysis the internal destructive forces throughout the whole system are computed at a stage when the material in the whole system is still elastic. The section within the system which has the largest destructive force then governs the strength of the whole system.

In limit design, the internal destructive forces throughout a structural system at collapse of the whole system are computed. Material is extremely democratic. When one section reaches its ultimate strength, it throws some of its destructive forces onto the other sections, which are either subjected to smaller destructive forces or are stronger than the considered section. Collapse of the whole system occurs when a number of sections throughout the system have failed.

Let us illustrate the difference between the elastic and limit analyses by a simple example. Suppose a simply suported beam is subjected to a uniformly distributed load. Maximum bending moment would occur at midspan and its magnitude would be $\frac{w_1 l^2}{8}$. Assume that the beam is just strong enough to resist this bending moment. If this beam, however, is fixed at its ends, bending moments under the same loading would be $\frac{w_1 l^2}{12}$ at the ends and $\frac{w_1 l^2}{24}$ at midspan. Since the capacity of the beam is $\frac{w_1 l^2}{8}$, we may increase the load by 50 per cent. With the increased load, bending moments would be $\frac{w_1 l^2}{8}$ at the ends and $\frac{w_1 l^2}{16}$ at midspan. By elastic design, the beam would be considered to have reached its ultimate capacity. Actually, we may increase the load still further. By doing this, end bending moments would not change, but the bending moment at midspan would increase. The ultimate capacity of the beam would be attained when bending moment at midspan reaches the value of $\frac{w_1 l^2}{8}$. Thus, limit design indicates that collapse of the beam would occur at a much higher load than predicted by elastic design.

What is the advantage of the three concepts? The purpose of structural engineering is to design a safe structure in the most economical way. By safety, we imply that a structure would collapse only when the external loads for which it has been designed are increased by a certain percentage. This percentage is called "factor of safety." In elastic analysis, factor of safety is applied to the strength of only one section in the structural system. But the strength of one section does not necessarily represent the strength of the entire structure. Hence, elastic analysis does not always result in a rational or an economical structure, since many sections which have not been utilized to their capacity would exist in a structure so designed. On the other hand, a factor of safety applied to the collapse of the entire structural system would represent the true factor of safety and the material in a structure so designed would be completely utilized.

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PRODUCTS, EQUIPMENT, MATERIALS

Report of recent developments by industry, based on data furnished by mfrs. Inquiry cards for further information face pages 1 and 60.

EXPANDABLE ROTARY FILE

MFR'S DESCRIPTION: a horizontal rotary file that expands up to six times its original capacity without adding any additional floor space.

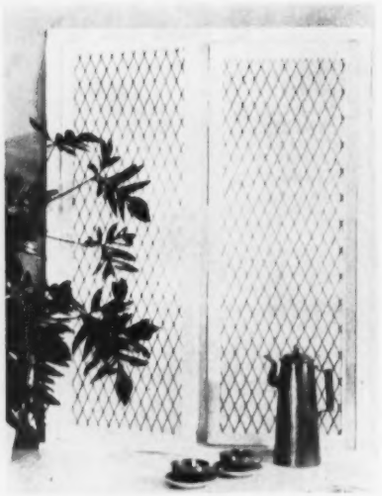
USES: office storage.

SPECS/FEATURES: basic principle is that of the horizontal wheel or *Rotor-Tier*. Instead of being parallel to each other in a rectangular space, as in a drawer, folders of records are filed radially, around the hub, which is so balanced that finger pressure on the rim substitutes for the push-pull necessary with drawers. Basic innovation is that it can be installed one *Rotor-Tier* at a time, if desired, and expanded as need requires—all on the same base occupying a floor area of only 48″ wide by 42″ deep. Capacity of each tier averages the equivalent of four file drawers.

AIA FILE NO. 35-H-42

MFR: WASSELL ORGANIZATION, INC.

Circle 200 for further information



LEADED FIBERGLASS USED FOR GLASS PANELS

MFR'S DESCRIPTION: *Leaded Glass*, a translucent fiberglass panel, is an indestructible combination of glass fibers, resins, and embedded steel strips.

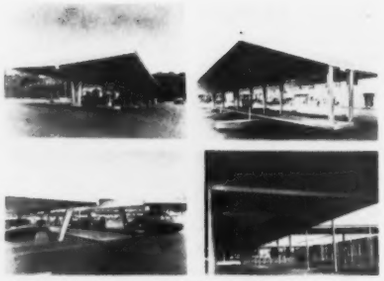
USES: decorative applications, dividers, partitions, tub enclosures, breakfronts, marquees, etc.

SPECS/FEATURES: it is shatterproof, acid and moisture resistant, will not stain, and can be wiped clean with a damp cloth or sponge. A choice of crystal green or clear panels, measuring 24″ x 96″ is available, with either gold or steel colored strips embedded within the fiberglass. Patterns are available in diamond or shell design.

AIA FILE NO. 26-A-5

MFR: THE BARCLITE CORP. OF AMERICA

Circle 201 for further information



STEEL CANOPIES FOR WEATHER PROTECTION

MFR'S DESCRIPTION: line of architecturally designed steel canopies that are stated to enhance the appearance of commercial and industrial structures while offering effective weather protection.

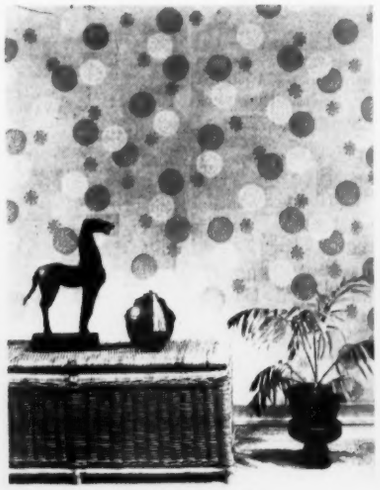
USES: car ports, customer and auto service areas, covered walkways, service stations, passenger loading stations, shelters, display and maintenance areas, etc.

SPECS/FEATURES: canopies are available in a wide choice of styles and sizes, and are delivered to the site ready for erection. They offer a weathertight roof of interlocking *Steelox* panels, flat and smooth underneath, and coated with aluminum or zinc to reflect the sun's rays and resist corrosion. Available in four basic models, canopies are designed and engineered to meet building code requirements, and are erected without disturbing normal operations.

AIA FILE NO. 15-H

MFR: ARMCO DRAINAGE & METAL PRODUCTS, INC.

Circle 202 for further information



CANVAS CLOTH/VINYL FABRIC WALLCOVERING

MFR'S DESCRIPTION: *Endura-Cloth* is a stainproof vinyl fabric wallcovering with a strong woven canvas cloth foundation.

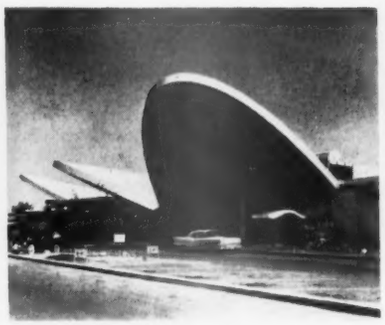
USES: residential and institutional applications.

SPECS/FEATURES: *Endura-Cloth* features a manufacturing technique in which design patterns in multiple color pigments, along with vinyl resins, are integrated with the strong cloth foundation. Guaranteed to withstand 25,000 scrubbings, all stains including grease, cold cream, crayon, and indelible ink, can be easily removed with soap and water. Woven canvas foundation is recommended by mfr for covering imperfections, cracks and patching to attain a smooth decorated surface. It is scuff-resistant, waterproof, steam and fire resistant, and can be easily removed just by pulling off. Endura-Cloth will retail for from $5.50 to $8.50 a single roll. Matching fabrics generally run from $1.98 to $2.98 a yard.

AIA FILE NO. 28-C

MFR: UNITED WALLPAPER CO., DIV., DESOTO CHEMICAL COATINGS, INC.

Circle 203 for further information



ELASTOMERIC ROOF COATING

MFR'S DESCRIPTION: roof coating designed for quick and safe application to roofs of any configuration stated to provide better weatherproofing and lasting beauty.
USES: all types of curved or flat roofs.
SPECS/FEATURES: roof coating is compounded from DuPont *Neoprene* and *Hypalon*. It weighs only 1/25th as much as conventional coatings. It has no edges or valley joints to cause water seepage. Its elasticity covers hairline cracks, gives with minor movements of the subsurface, and resists running or chipping. It is applied by brush, spray, or roller—without heating—and becomes fire-resistant as it cures through chemical action. It is available in a wide variety of colors and may be textured as desired. Illustrated is the Country Club Bowl, Sacramento, California, by architects Powers, Daly & DeRosa, Long Beach, Calif.
AIA FILE NO. 12-A
MFR: CARAM MANUFACTURING CO.
Circle 204 for further information

Circle 107 for further information →

Tuckahoe Junior High School, Henrico County, Va. *Principal:* I. Herbert Levenson; *Architects:* Commonwealth Engineers and Architects, Godwin W. Draper; *Construction superintendent:* George L. Eitel; *General contractor:* Ivy Construction Corporation, Charlottesville, Va.; *Panel distributor:* Sash, Door & Glass Corporation, Richmond, Va.; *Installer:* N. W. Martin & Brothers, Richmond, Va.

How to cut school cost without cutting quality

These fire-retardant panels bring "tree-shade" light into Tuckahoe Junior High School . . . require practically no upkeep . . . open the way to a $200,000 saving.

The conventional grammar school in Henrico County, Va., costs $13.25 a square foot. This campus-type school, if built with the corridors inside, would have cost $14 to $15.

Its actual cost: only $11.38 a foot.

The saving, amounting to $209,440, is in the plastic-roofed walkways that take the place of corridors in this 112,000-square-foot school. They eliminate an interior wall and make possible a large reduction in classroom roof area and total enclosed cubage.

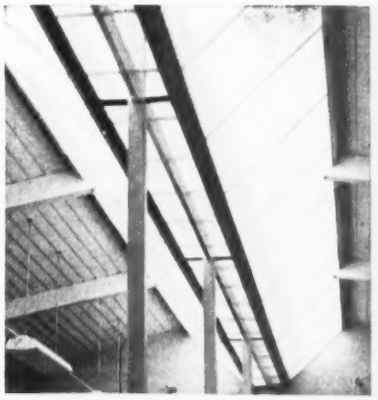
Soft, controlled daylighting Overhanging the walkways by nine feet, the ivory-tinted panels diffuse light softly at a specified transmission value of 60%. More light filters into classrooms through large plastic skylights that double as plenum chambers for wiring and ducts.

One architect says the light quality "duplicates ideally the soft, even light in the shade of an apple tree." So well does light diffuse through the skylights that an 18-inch duct in the plenum casts no visible shadow.

On a square-foot basis, the unusual skylights cost about one-third as much as ordinary framed skylights. Rain washes the panels clean on the outside, and they never need painting. A special lacquer protects the surface and preserves the color; it needs to be renewed only once every three or four years.

Can't spread a blaze These glass-reinforced panels are made with Hetron®, an inherently flame-retardant polyester resin which we produce. They do not shatter, and will not support combustion. Designed to meet stiffest code requirements, they carry the U/L label and Factory Mutual seal of approval.

For information on Hetron and names of panel fabricators, write us.



Classroom skylights double as plenum chambers. Diffused light makes enclosed wiring and ducts all but invisible.

DUREZ PLASTICS DIVISION
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PRODUCTS, EQUIPMENT, MATERIALS

OFFICE AIDS

TABLE/WALL MOUNTED WHITEPRINTER

MFR'S DESCRIPTION: compact, table or wall mounted whiteprinter with a variable printing speed range up to 10 feet per minute controlled by a single knob with full reverse feature.
USES: architectural and engineering offices, schools, offices.
SPECS/FEATURES: wide feed table simplifies feed and return. A horizontally mounted, self-sealing chamber processes several prints simultaneously. *Copymaster* produces sharp prints quickly from any translucent material, makes excellent intermediates and sepias, mfr states. Unit is housed in 18 ga. steel finished in baked-on enamel harmonizing office colors. Dimensions are 6¼" x 9¼" x 58½" and over-all weight is 80 lbs. Three easily replaceable special black light fluorescent lamps provide the light source. Unit plugs into standard electrical outlet. The developing chamber, made of aluminum, is 4" x 4" x 55¼" and weighs 4 lbs. Unit priced under $300.00.
AIA FILE NO. 35-H-3
MFR: COPYMATON, INC.
Circle 205 for further information

FASTER BLACK LINE INTERMEDIATE PAPER

MFR'S DESCRIPTION: a black line intermediate paper *(102 ITF)* offering fast speed and reprint density for increased print production.
USES: architectural, engineering, and military drawings; office copying; and accounting work sheets.
SPECS/FEATURES: mfr reports five outstanding advantages from transparentized intermediate: 1) extremely high opacity for greater covering power with no sacrifice in printing speed which results in greater ability to pick up fine detail from weak pencil line tracings and gives wider latitude in reprinting; 2) black image color which provides easy readability for drawing or shop use in addition to being excellent for duplicating by photographic or *Xerographic* reproduction processes; 3) the 100 per cent rag content high quality tracing vellum base which offers good drawing surface for pencil or ink and gives high durability and resistance to wear; 4) product is permanently transparentized to insure high reprint speed with continued use or aging. In addition, the transparentizer will not transfer to other papers in file; 5) the material is claimed to be unique due to its interfileability with silver materials. It will not adversely affect *Van Dyke* or photographic materials in file.
AIA FILE NO. 35-H-31
MFR: OZALID DIV., GENERAL ANILINE AND FILM CORP.
Circle 206 for further information

BUDGET-PRICED PHOTOCOPIER

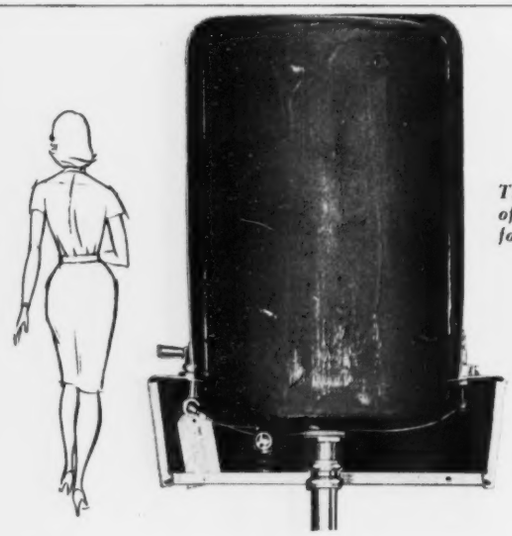
MFR'S DESCRIPTION: budget-priced photocopier called the *Transamatic* incorporating many features of more expensive models.
USES: office duplication.
SPECS/FEATURES: no-mix solution cartridge contains pre-mixed solution which is snapped into place and discarded when the solution is used up. The machine automatically fills and drains when it is turned on or off reducing exposure to air and eliminating waste by evaporation. Within its two-tone housing are concealed paper safes. All electric, the machine requires no special installation. Will reproduce any color, anything written, typed, printed or drawn in 11 seconds.
AIA FILE NO. 35-H-3
MFR: TRANSCOPY, INC.
Circle 207 for further information

PAPER SHREDDER FOR OFFICE USE

MFR'S DESCRIPTION: the *Destroyit* is an office model paper shredder stated to be able to shred eight sheets of bond paper at once.
USES: executive offices.
SPECS/FEATURES: unit comes with movable cabinet and has its own removable waste-bin where the shreds are caught. In one hour, unit will provide for 88 lbs. of shredded wool, excellent packing and shipping material from what was previously discarded. Its height is 34-4/5", width 17-3/5", and depth, 15-3/5". Riding on casters, it is easily moved to favorable working spots in the office or plant. Weight, 71 lbs.
AIA FILE NO. 35-N
MFR: MICHAEL LITH SALES CORP.
Circle 208 for further information

LOW-COST ELLIPSE SERIES TEMPLATE SET

MFR'S DESCRIPTION: professional quality ellipse series of draftmen's templates consisting of ten templates with 246 ellipse cut-outs from 15° through 60° in increments of 5°, and from ⅜" through 2-½" major axes.
USES: office drafting.
SPECS/FEATURES: each template has an extended tab showing the degree of the cut-outs thereon. Each ellipse cut-out on each template has centering or locating pinholes for both major and minor axes. The templates are 6" x 10", made of tinted, instrument-grade Eastman *Tenite II* plastic, and the material is of thin, .020

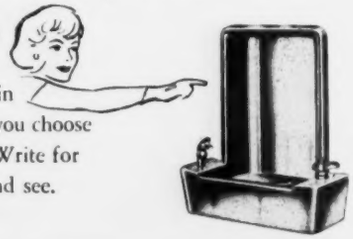


This is the back of Haws drinking fountain model 73

Look at the Back for a change!

Even our competitors' fountains look good from the front, but *Haws* models back up their good looks! This semi-recessed Model 73, for instance, is a beauty in 18 gauge, 304 stainless steel – and the craftsmanship goes *all the way around!* Careful quality is the standard at Haws – even on features you can't see. This fountain gives you automatic stream control; even has its head *locked* to the bowl for vandal-proof service.

And let's face it



This handsome Model 73 adds built-in class to hallways, lobbies – anywhere you choose to specify its beauty. You can't miss! Write for Haws comprehensive 1961 catalog and see. Write now!

Since 1909 HAWS **DRINKING FOUNTAINS**
a product of
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Circle 108 for further information

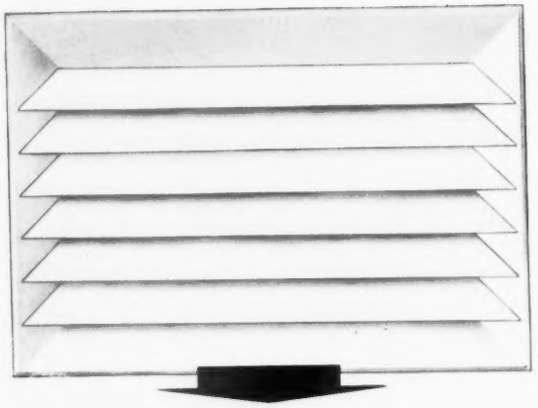
Circle 109 for further information about TUTTLE & BAILEY →

TYPE M

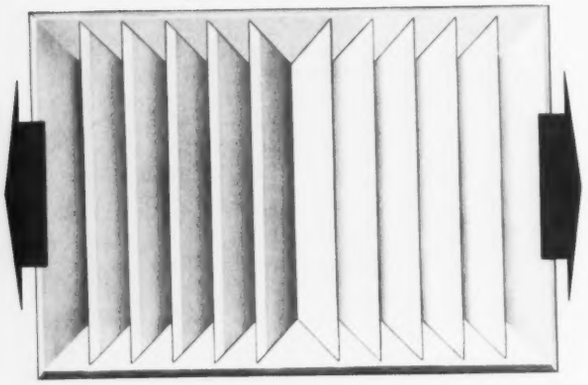
Multi-Pattern Diffusers

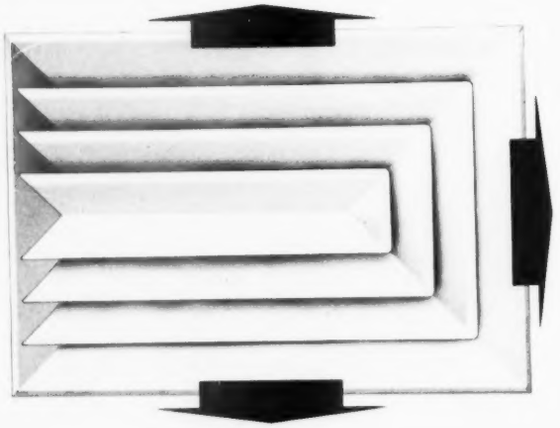
The extreme flexibility of **Type M Multi-Pattern Diffusers** *means custom-selected air distribution*

TYPE M 1-WAY BLOW

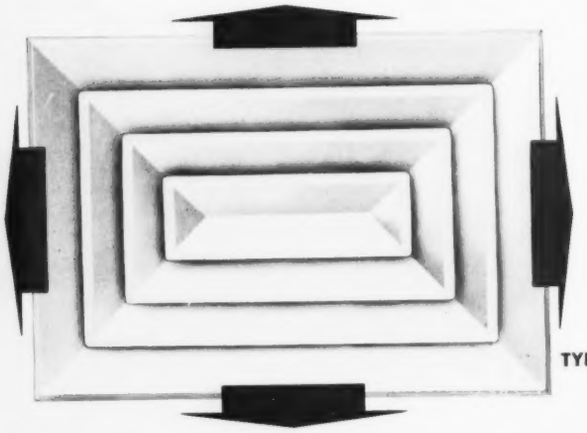


TYPE M 2-WAY BLOW





TYPE M 3-WAY BLOW



TYPE M 4-WAY BLOW

Ideal conditions for the placement of ceiling diffusers do not always exist. Walls, partitions, exposed beams, supporting columns, light fixtures . . . big offices, small offices, corridors . . . are some of the factors that can contribute to the problem of correctly selecting and locating air distribution outlets.

With Tuttle & Bailey Type M Diffusers . . . you can select units that will distribute air in a one-, two-, three-, or four-way pattern . . . and you can select from a wide range of square and rectangular sizes. An added advantage . . . if and when requirements change in the conditioned space, it is an easy matter to install a core with a different air pattern arrangement.

T & B Type M Diffusers are attractively styled and can be furnished with four margin styles . . . beveled, flat, flush, or drop-collar . . . designed for various types of ceiling mountings.

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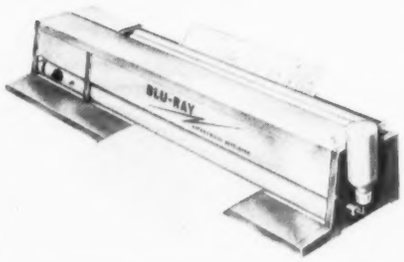
ga. for shadowless viewing and greatest tracing accuracy. Complete set retails for $9.50.
AIA FILE NO. 35-H-3
MFR: TIMELY PRODUCTS CO.
Circle 209 for further information

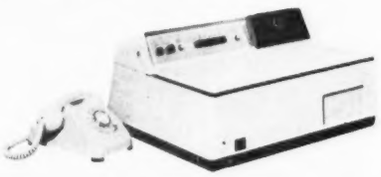


LOW COST CONTINUOUS DIAZO DRY DEVELOPER

MFR'S DESCRIPTION: a low cost continuous action developing machine for developing *Diazo* papers and materials.
USES: companion unit to all *Diazo* whiteprinters and the larger moist process machines.
SPECS/FEATURES: a portable rotary type dry developer, the *Blu Ray* will develop prints up to 42" in width of any length, at variable speeds of from 4" to 72" per minute. It is stated to provide faster print developing production than the conventional stack or tube type developers; it does away with the inconvenience and unpleasantness of filling ammonia cups. In addition to *Diazo* papers, the machine will develop foils, sepias and sensitized cloth. Largest model with 42" capacity is priced at $137.50.
AIA FILE NO. 35-H-31
MFR: REPRODUCTION ENGINEERING CORP.
Circle 210 for further information

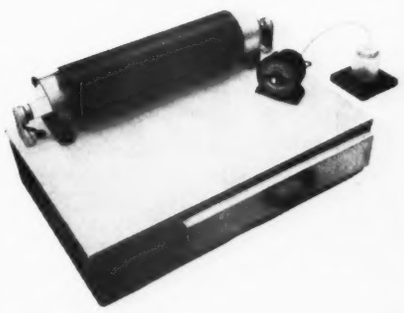
ELECTROPHOTOGRAPHIC OFFICE COPYMAKER

MFR'S DESCRIPTION: compact, desktop photocopier using an electrophotographic copying process.
USES: permanent, legally acceptable black on white copies of any written, printed, typed, drawn or photographed material.
SPECS/FEATURES: machine requires only 18 x 22 inches of desk surface. Modular construction permits quick service, and individual components may be removed and replaced without dismantling the machine. The *Electro-Stat* plugs into any convenient 20 amp 110 volt outlet. Machine is said to be particularly precise in its reproduction of half-tones and solids. Subtle tones and color gradations appear as corresponding shades of gray. Every copy is an offset master capable of producing up to 200 copies for as little as 1/5¢ each. The unit is available on a rental basis for less than $40 per month, or purchased for about $1,495.
AIA FILE NO. 35-H-4
MFR: AMERICAN PHOTOCOPY EQUIPMENT CO.
Circle 211 for further information



TRANSISTORIZED ANSWERING SET CONNECTED TO PHONES

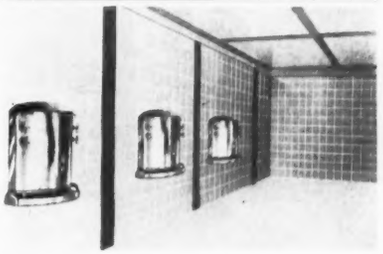
MFR'S DESCRIPTION: transistorized telephone answering set—all-tape model LP—will record messages of varied lengths up to one hour's duration (two-hour capacity is also available).
USES: office applications.
SPECS/FEATURES: modular construction is a big feature of the *Electronic Secretary*. The unit contains three sections: 1) Cabinet. The modern housing was designed by Raymond Loewy. 2) Transport mechanism. Contains tape deck, motorboards, speaker and motor control. 3) Chassis. Houses power supply and basic switching apparatus—three plug-in printed circuit boards. Messages which have been received while the subscriber is out may be played back by depressing a "playback" button. To erase messages, the subscriber merely depresses the "rewind" and "erase" buttons and the set is ready to accept new messages. Other features include a "time-out" device. Should a caller remain silent for as long as 12 seconds, he will automatically be disconnected. Also, if the one-hour (or two-hour) tape is used up, the machine transmits a high tone for 12 seconds and automatically shuts itself off. Other features available on an optional basis.
AIA FILE NO. 31-i-5
MFR: ELECTRONIC SECRETARY INDUSTRIES, INC., SUBSIDIARY, GENERAL TELEPHONE & ELECTRONICS CORP.



LOW-COST COPYMAKER

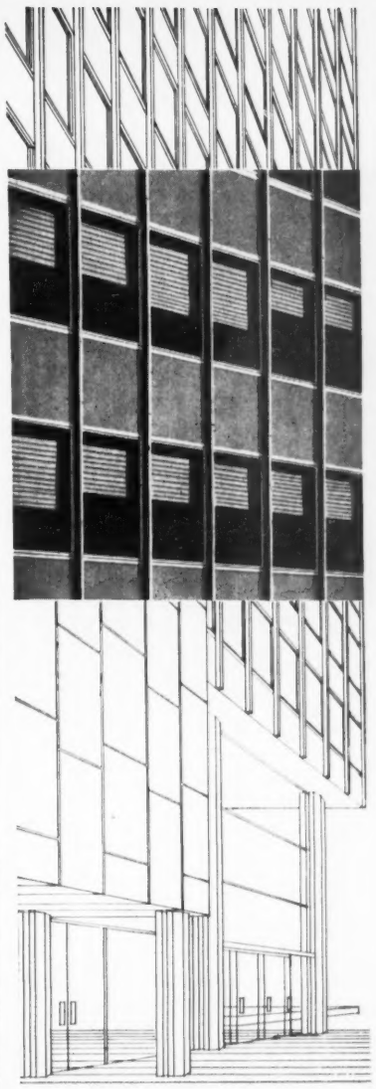
MFR'S DESCRIPTION: complete, low-cost, dry-process duplicator.
USES: small offices.
SPECS/FEATURES: machine employs ordinary *Diazo-type* dryprinting paper. Cost per 8½" x 11" sheet is less than two cents. Reproductions are possible in any color, or several different colors, and in any size up to 11" x 17". Entire copying operation can be done in normal daylight. *Copymaker* measures 20" x 10" x 9". It weighs less than 15 lbs. and may be easily carried. It plugs into any standard 110-volt AC outlet. *Copymaker* sells for $89.50 complete. A timer is available for $15.00. With built-in timer, machine sells for $103.50.
AIA FILE NO. 35-H-4
MFR: COPYMAKER CO.
Circle 213 for further information

PLUMBING UNITS



WASH AND SHOWER LINE FOR SCHOOLS

MFR'S DESCRIPTION: series of products especially designed for schools including stainless steel column showers, stainless steel wall hung showers, and a 36" semi-circular sage green waterfountain.
USES: school and institutional applications.
SPECS/FEATURES: stainless steel column showers provide savings in material, space and installation costs because they serve as many as five students with only three plumbing



CURTAIN WALL

A refreshing new approach to metal curtain wall construction — Series 400 by Albro. It combines new design flexibility with light weight, economy and fast installation. Albro fabricates a complete line of aluminum, bronze and stainless steel systems — all backed by over 30 years of metal engineering know-how. See them in Sweets or write

ALBRO
METAL PRODUCTS CORP.
944 Longfellow Avenue
New York 59, New York

Circle 110 for further information

← Circle 109 for further information about TUTTLE & BAILEY

connections—two supplies and one drain. Semi-circular stainless steel wall-mounted showers are completely self-contained. The space saving units are available in three-student or two-student models and can be located on walls at any height. Semi-circular washbasin features foot control and provides for three students simultaneously.

AIA FILE NOS. 29-H, 29-H-3

MFR: BRADLEY WASHFOUNTAIN CO.

Circle 214 for further information

PORCELAIN/STEEL LAVATORIES

MFR'S DESCRIPTION: addition of two porcelain-on-steel lavatories to line of vitreous china and steel lavatories.

USES: bathroom installations.

SPECS/FEATURES: 18" round pullman lavatory, No. 708, can be installed with ceramic tile, marble or any other counter material. No. 738P is an exposed front, counter top lavatory especially made for plastic top installations and requires a minimum of space. Both basins have integral overflows. Available in pink, tan, yellow, blue, green, gray, and white.

AIA FILE NO. 29-H-6

MFR: NORRIS-THERMADOR CORP.

Circle 215 for further information

DOORS & HARDWARE

TRANSLUCENT, OVERHEAD TYPE GARAGE DOORS

MFR'S DESCRIPTION: a sectional overhead type door said to be so translucent that it lights up the interior "like a skylight."

USES: industrial and commercial applications.

SPECS/FEATURES: *Filuma,* in sizes up to 14' wide or 14' high, is a reinforced fiberglass panel available in five different colors. It is shatterproof, shrinkproof, weatherproof and is impervious to corrosion, mfr states. It weighs only one-third as

PYROFILL provides test-proved one- to two-hour fire endurance; helps maintain dimensional integrity; resists structural failure; fights fire temperature transfer —for greater safety and protection, and lowest insurance rates.

PROTECTION

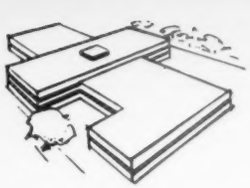
PYROFILL*

poured gypsum roof decks

Circle 111 for further information

You can satisfy *any* performance requirements, thanks to a choice of seven USG® Formboards. Use them individually, or in combination, exactly where you want them—that's the versatility possible with PYROFILL Roof Decks.

VERSATILITY



Responsibility for expert application of PYROFILL Gypsum Concrete is centered in a single U.S.G.-approved contractor—*a roof deck specialist* who is skilled and experienced in all phases of poured gypsum construction.
See Sweets 2d/Un.

UNITED STATES GYPSUM / *the greatest name in building*

*T.M. Reg. U.S. Pat. Off.

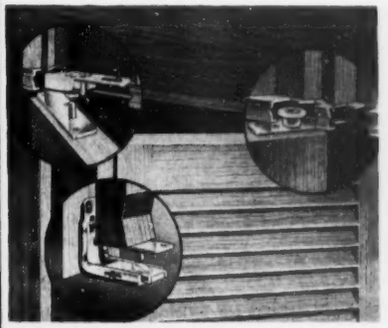
UNITED STATES GYPSUM

Circle 111 for further information

PRODUCTS, EQUIPMENT, MATERIALS

much as wood doors, making possible efficient automatic operation with small power units.
AIA FILE NO. 16-D
MFR: FRANTZ MANUFACTURING CO.

Circle 216 for further information



FOLDING DOOR HARDWARE

MFR'S DESCRIPTION: line of folding door hardware that makes it possible to remove doors by just snapping them in and out of the opening.
USES: folding doors.
SPECS/FEATURES: series *4400* hardware features the *Auto-Close Jamb Bracket* that insures tight door closures with no gap such as develops when doors are held with springs, rubber bumpers or other devices. Top-mounted hangers feature big, spring-loaded nylon wheels to eliminate exposure of hardware.
AIA FILE NO. 27-A
MFR: KENNATRACK CORP.

Circle 217 for further information

WOOD FOLDING DOORS AND PARTITIONS

MFR'S DESCRIPTION: line of wood folding doors and partitions which combine desire for paneling with the function of folding doors.
USES: interior applications.
SPECS/FEATURES: *Standard Line* is designed with patented built-in "memory" hinge that causes quiet, even movement of the panels to the most attractive position. Doors are top supported by heavy-duty extruded aluminum track at the head, and hangers of self-lubricating, all nylon wheels and guides on every panel. Stainless steel latch and jamb mold requiring no mortising of the jamb is furnished with each door at no extra charge. Available in American walnut, mahogany, oak, birch, ash and pine. Catalog on request.
AIA FILE NO. 16-M
MFR: PANELFOLD DOORS, INC.

Circle 218 for further information

Calculate wherever you circulate

with the NEW *Jet-log jr.* SLIDE RULE BY K&E

one-half actual size

Functional as it is, a 10-inch slide rule just wasn't meant for stuffing in the pocket of a business suit. Just as the 10-inch is best for desk-duty, the 5-inch JET-LOG Jr. is *ideal* for the man on the go. Has the same famed Decitrig Scale System as its "big brothers"; the DECITRIG® and JET-LOG Slide Rules. Made of durable IVORITE® with top grain leather case, clip, *and* . . .

Clips neatly onto your pocket. Look for this display carton. *(A wonderful gift item, too!)*

only **$10.25**

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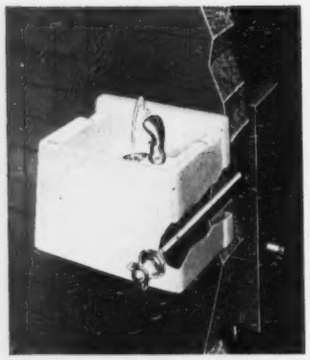
Circle 112 for further information

it's new—it's a Halsey Taylor



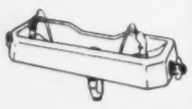
No. 5907 "ALL-CLIMATE" Outdoor Fountain
Patent Pending

An Outdoor Wall Fountain with Superior All-Weather Features

This new Halsey Taylor All-Climate Outdoor Fountain has exclusive all-weather features for outdoor use. Automatic frost-proof supply valve and drain assembly provide complete drain-back into cabinet in rear of wall. Valve extensions can be made to exact wall thickness. All exposed fittings chromium plated.

See Sweet's or the Yellow Pages

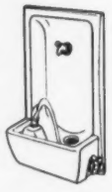
The Halsey W. Taylor Co., Warren, O.



Battery Wall Fountains

601

Pedestal Fountains



Recess Wall Fountains

Circle 113 for further information

PRODUCTS, EQUIPMENT, MATERIALS

LIGHTING UNITS

LOW VOLTAGE SWIMMING POOL LIGHTS

MFR'S DESCRIPTION: a decorative cast-bronze swimming pool light that produces 51,000 candlepower on only 12 volts.

USES: above and underwater small and medium sized pool illumination.

SPECS/FEATURES: low-voltage "safety-light" concentrates entire output in a flat, high-intensity beam. Extra long rubber-jacketed cord permits wet-niche pool light to be surfaced for quick service without emptying pool or disturbing electrical connections. Units available with clear or colored flood, spread or deflecting lenses for special underwater lighting effects. Pre-formed copper niches, cast bronze deck boxes with step-down transformers, and other accessories permit fast installation in new or existing concrete, gunite, tile, steel or fiberglass pools. Underwater line includes fountain and wet-niche pool lights for 200W-300W standard voltage 2000-hr sealed beam lamps, 100W-200W cascade and pond lights, fully submersible junction boxes. UL-approved.

AIA FILE NO. 31-F-28

MFR: STONCO ELECTRIC PRODUCTS CO.

Circle 219 for further information

LOW-COST LIGHT DIMMER SWITCH

MFR'S DESCRIPTION: low-cost, electronic diode light dimming switch which provides dim, bright, and off control of room lighting.

USES: residential applications.

SPECS/FEATURES: mfr stresses economy of *Lo-High* light control dimmer switch. Sized to fit standard residential boxes and plates, it installs easily and simply and is wired exactly as regular on-off switches. It can handle incandescent loads up to 300 W. A 500 W model is also available. Suggested list, $6.25.

AIA FILE NO. 31-F-25

MFR: B-C LIGHTING MANUFACTURING CO.

Circle 220 for further information

MULTI-PURPOSE WALL LIGHT

MFR'S DESCRIPTION: a fluorescent fixture adaptable to a wide variety of special, wall mounting lighting applications.

USES: lighting hospital beds, wash rooms, motel rooms, apparel fitting rooms, etc.

SPECS/FEATURES: unit makes use of two lighting components, up and down, either independently or jointly, depending upon the lighting needs of the location where it is mounted. According to mfr, it makes three distinct types of lighting available from a single unit. When both downward and upward components are used, a desirable balance of comfortable general illumination with direct reading or work light is obtained. Up light only provides general room lighting that will be comfortable even to bed-fast patients looking up at the ceiling. Down light only permits reading, working, etc., without lighting up an entire room. Fixture is made in 2', 3', and 4' lengths.

AIA FILE NO. 31-F-23

MFR: THE MILLER CO.

Circle 221 for further information

ALL ALUMINUM STEP & NIGHT LIGHTS

MFR'S DESCRIPTION: series of step and night lights to illuminate steps, curbs, driveways, garden areas, walkways, parapet walls, corridors, bedrooms, prison cells or any other outdoor weathertight or indoor low-level lighting applications.

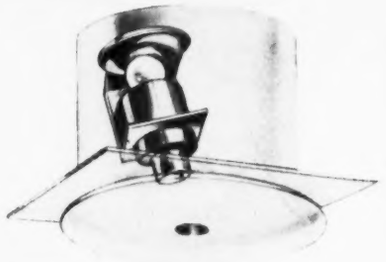
USES: drive-ins, hospitals, theatres, motels, hotels, prisons, schools, recreational facilities, etc.

SPECS/FEATURES: heavy-duty all aluminum construction includes threaded entries and suitable gasketing for vaportight installations. Choice of cast louver face baked with glass panel ¼" tempered glass diffuser or Holophane *Hi-Stress* asymmetric prismatic glass lens. Diffusers are caulked in face to insure watertight seal. Available in three sizes—for either surface or recessed mounting with optional cast aluminum external splice compartment for thru-circuit wiring and choice of incandescent or fluorescent lamps.

AIA FILE NO. 31-F-28

MFR: McPHILBEN LIGHTING, INC.

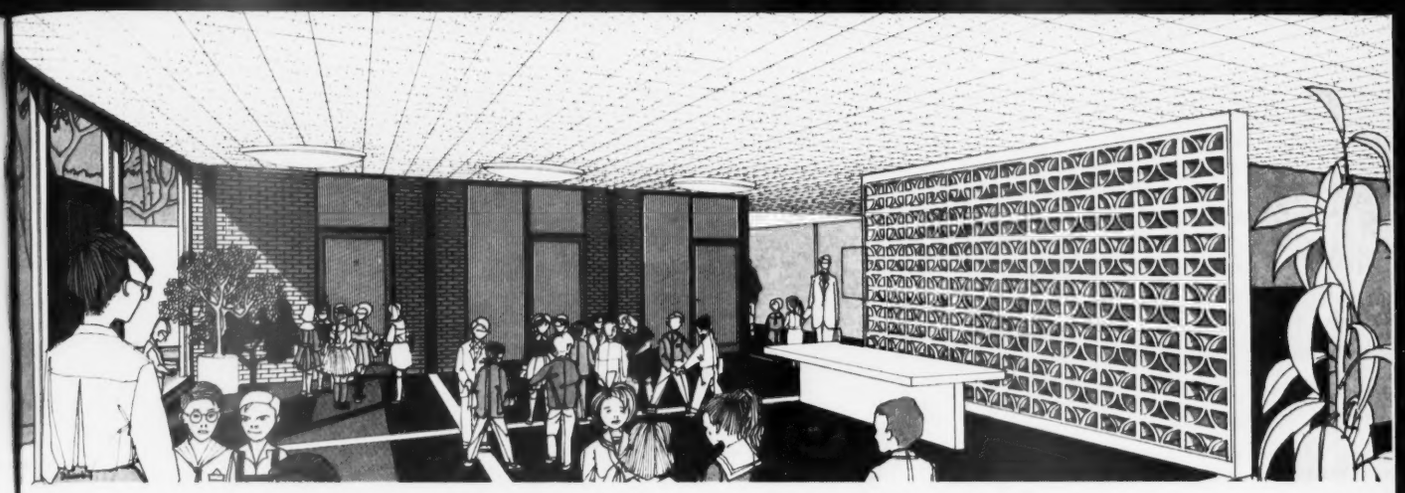
Circle 222 for further information



PROJECTOR SPOTLIGHT FOR HOME USE

MFR'S DESCRIPTION: *Projecto-Spot* is a projector spotlight which casts a beam to an exact room location.

Circle 114 for further information about ARMSTRONG pp 27-38 →

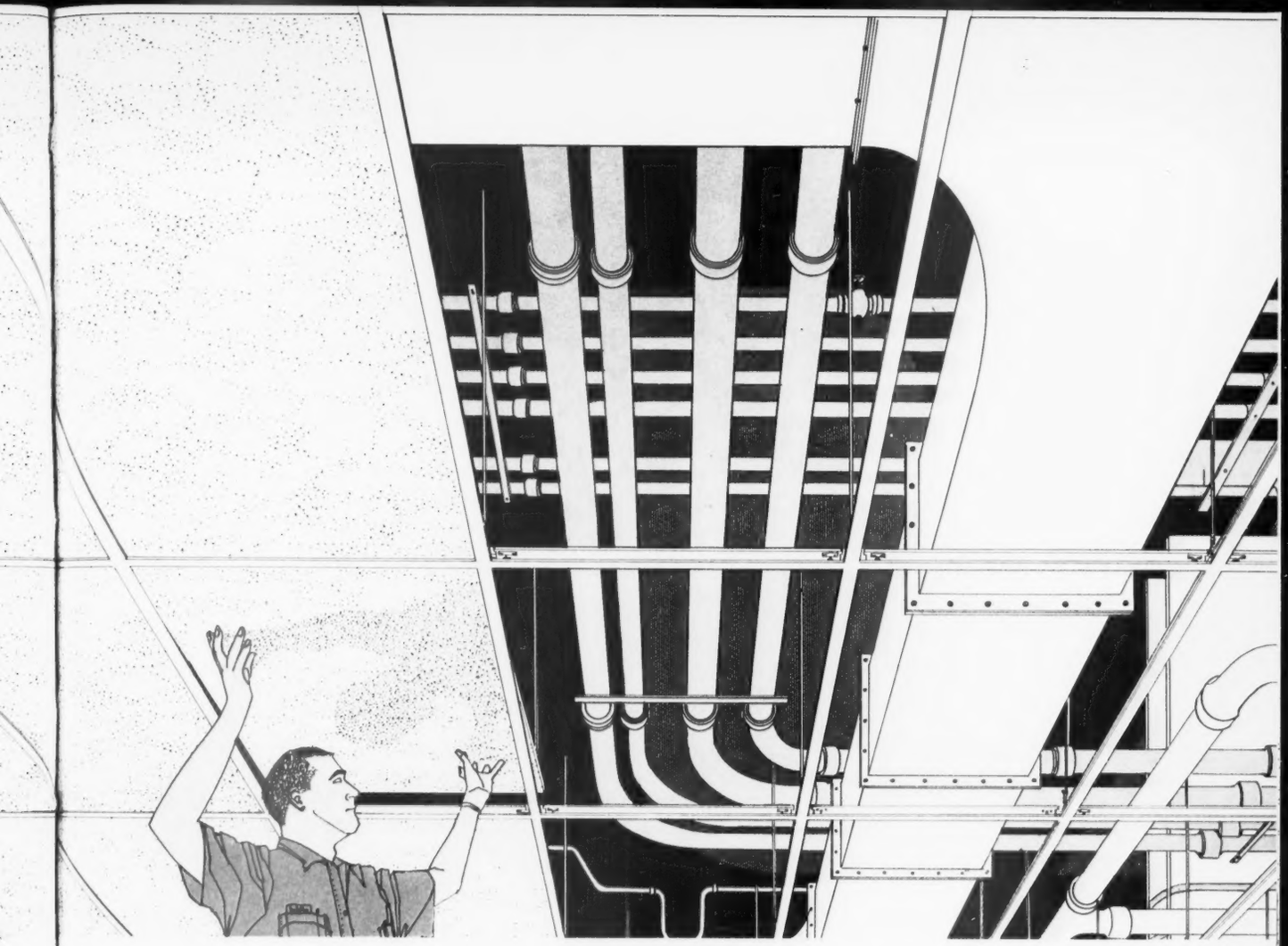


Centennial High School, Circle Pines, Minn. Architects: Ames-Crommett & Associates

Two years ago, Armstrong introduced the first time-design-rated acoustical ceiling tile—Acoustical Fire Guard. Today . . .

ARMSTRONG ANNOUNCES ANOTHER SIGNIFICANT DEVELOPMENT IN FIRE-RETARDANT CEILINGS

THE FIRST AND ONLY TIME-DESIGN-RATED ACOUSTICAL LAY-IN CEILING



Now there is no more economical way to get rated fire protection plus excellent acoustical qualities. It also offers the advantages of complete accessibility, dry installation, insurance savings, and beauty.

Once or twice in every decade, a company will develop a really new building product—a product that completely overhauls the industry's thinking. Two years ago, Armstrong did it with Acoustical Fire Guard tile. Since then, millions of feet of this tile have been installed.

Acoustical Fire Guard meets the nation's strictest fire codes and eliminates the need for costly intermediate protection between a suspended acoustical ceiling and steel structural members. It has saved builders up to six weeks' construction time and up to 30 cents per square foot construction cost.

The new Acoustical Fire Guard lay-in ceiling system goes a giant step further. It combines the advantages of the exposed grid suspension system (economy, fast installation, complete accessibility) with those of a time-design-rated ceiling.

THIS U.L.-APPROVED GRID CEILING SYSTEM PROTECTS STRUCTURAL STEEL FOR THREE HOURS

Underwriters' Laboratories, Inc., has given this revolutionary ceiling an official beam protection rating of three hours.

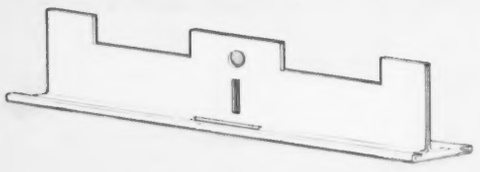
The unique composition of the Fire Guard lay-in unit enables it to maintain spanning strength, even when exposed to flames and 2000-degree heat for many hours. Ordinary acoustical ceiling boards virtually disintegrate under such exposure.

And the grid system is unique, too. Standard grid systems would buckle quickly in the heat of the test chamber. This buckling would drop the lay-in units, thus exposing the structural members to heat and flame. There is no buckling with the Acoustical Fire Guard exposed grid system. The reason: the expandable joints. (See diagrams.) Both the metal members and the lay-in units carry the U.L. Label.

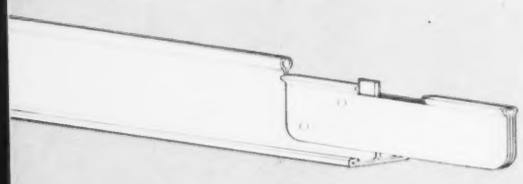
Like the familiar Acoustical Fire Guard tile, the new lay-in system protects the structural components of a building. It combines with a floor structure to help check the spread of fire by resisting the dangerous transmission of heat from one area to another.

In official U.L. tests, the new system—utilizing nominal 24″ x 48″ x ⅝″ lay-in units—earned a beam protection rating of three hours. Assemblies using bar joist and slab as well as beam and steel floor construction earned official U.L. floor-ceiling ratings of two hours.

And in either the new lay-in system or in tiles, Acoustical Fire Guard may be used with a variety of construction forms to meet building code or insurance rating requirements. Variations from tested assemblies which maintain or improve the fire-retardant rating have been accepted by local code officials, building inspectors, and rating agencies.



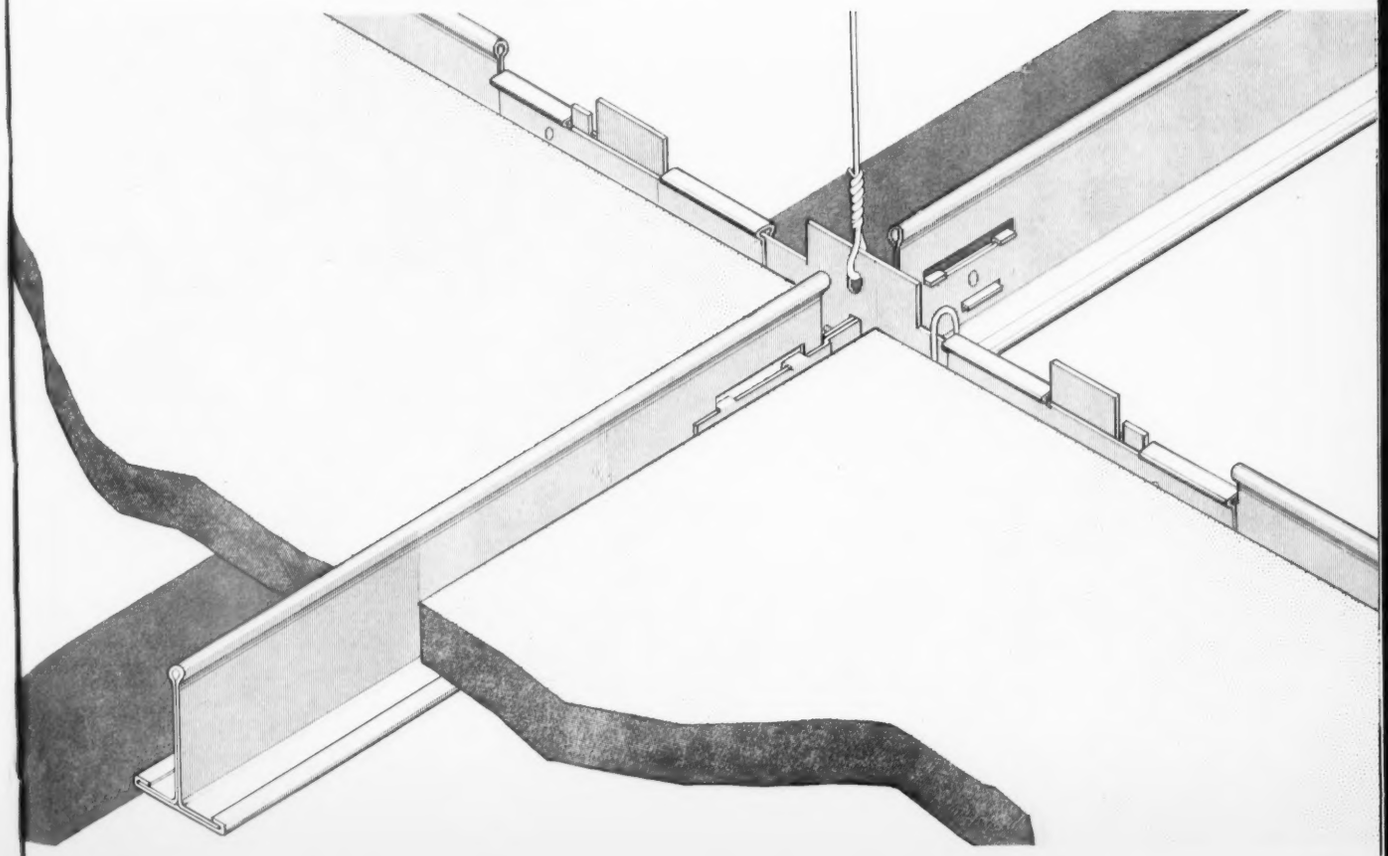
Hanger splice



Main tee

Cross tee

Acoustical Fire Guard lay-in units can withstand 2000-degree heat for prolonged periods. The suspension system is designed to permit expansion of metal runners when exposed to intense heat and flame.



SAVE MONEY AND CONSTRUCTION TIME

Acoustical Fire Guard lay-in system reduces labor and material costs, insurance premiums, maintenance charges—and it speeds both new and remodeling projects.

Armstrong Acoustical Fire Guard lay-in ceilings are more economical than other finished ceilings that will provide two- or three-hour protection for structural steel. In most cases, they will cost even less than ordinary plaster ceilings on metal lath.

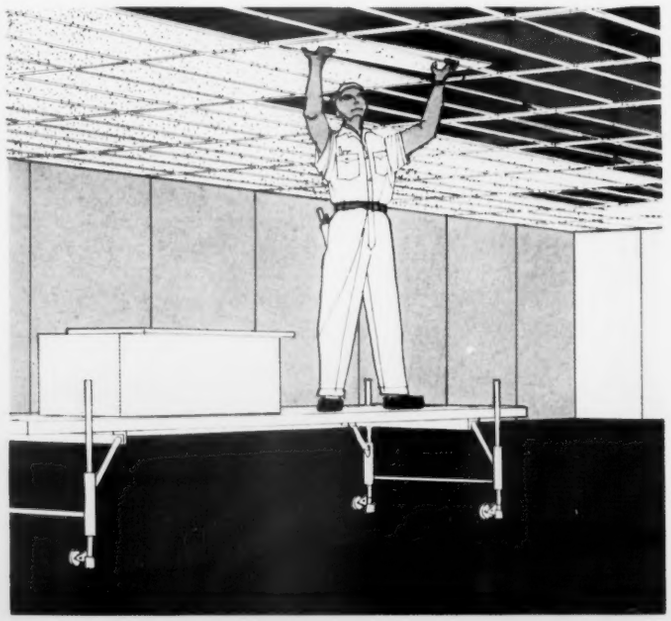
Not only is the cost of the units and the metal members low, but labor costs are lower because the large units are easy to handle and install.

Savings do not end with installation. Maintenance is minimized. Insurance companies recognize rated fire protection with lower premiums on a building and its contents.
Because there is no messy wet operation which requires extensive cleanup, this product is ideal for remodeling jobs. Installation can be done during or after office or school hours. Stores continue to earn revenue during the installation.

Acoustical Fire Guard helps builders to meet deadlines in another way. Other trades (such as carpenters, flooring contractors, and painters) can be on the job at the same time as the acoustical contractor. There is no waiting for wet work to dry. This alone can save weeks. When combined with the other time-saving advantages of Armstrong Acoustical Fire Guard lay-in units, the saving can amount to *two months or more.*

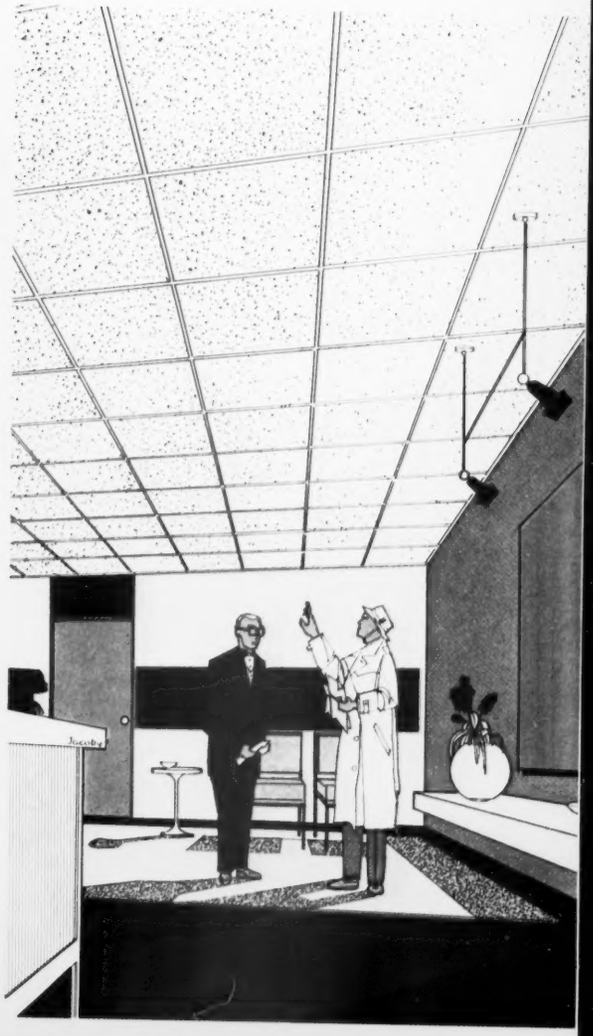
Excellent for remodeling jobs

Large units go in fast and dry

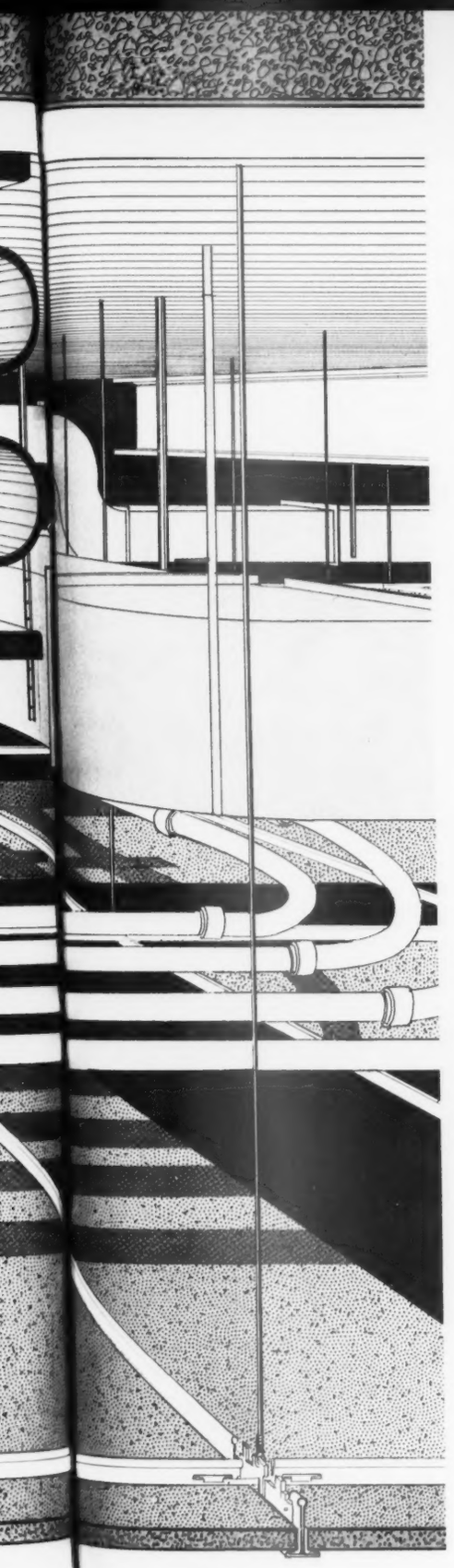


Other trades can be on the job

Protection cuts insurance rates



Jacoby



THE NEW ACOUSTICAL FIRE GUARD SYSTEM ALLOWS COMPLETE ACCESSIBILITY

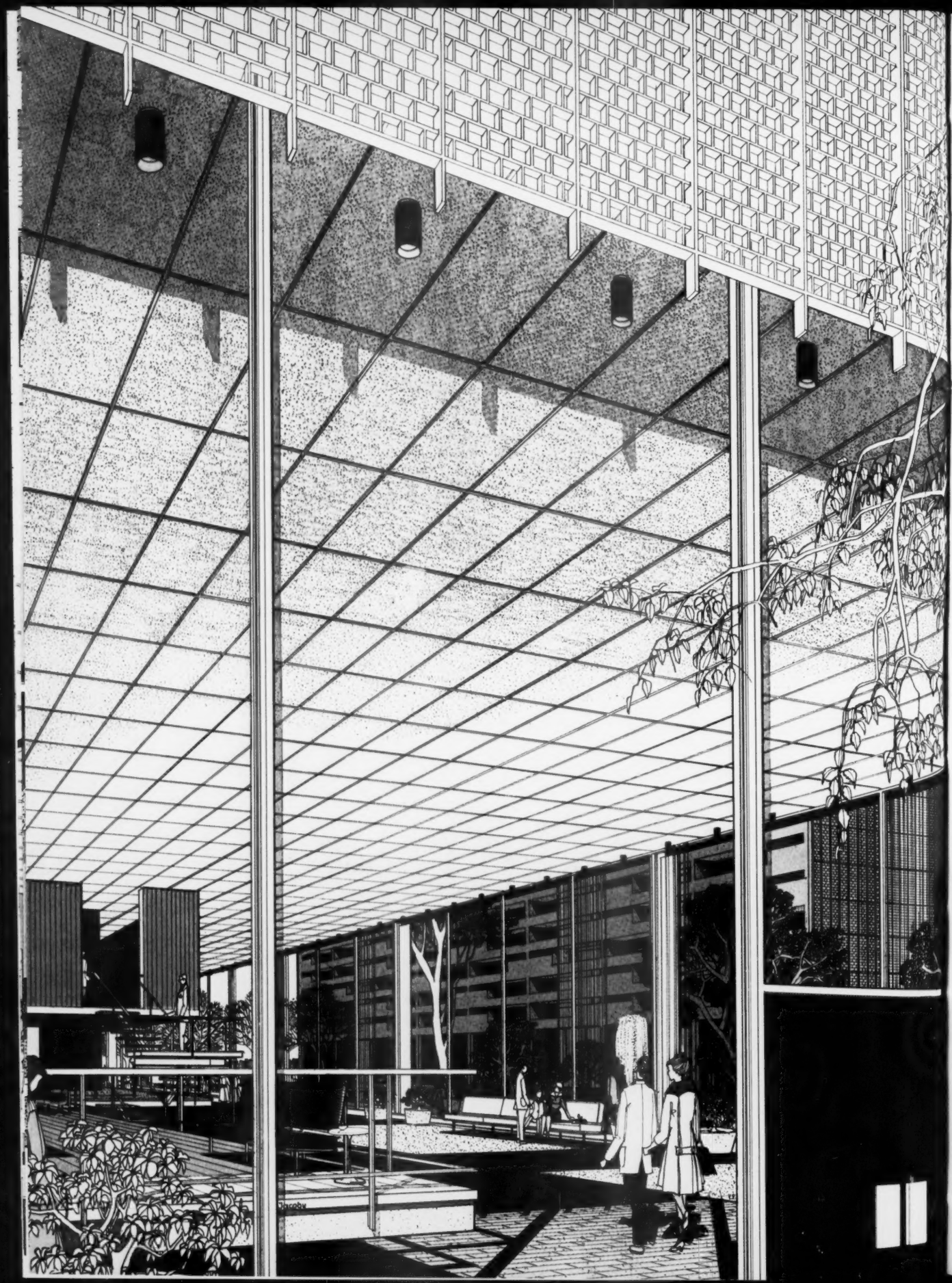
The Acoustical Fire Guard grid supports the panels on all four edges. The units can be lifted out for complete access to any part of the plenum chamber.

Because of the maze of pipes, ducts, and electrical equipment installed above the suspended ceilings of today's buildings, accessibility has become an important consideration in specifications. The only way to gain access through an old-fashioned plaster ceiling was by expensive access doors or by breaking through the ceiling when an emergency arose.

The Acoustical Fire Guard exposed grid system provides 100 per cent accessibility to the areas above the ceiling. Each panel is supported on all four edges. Every board can be lifted out in seconds.

The new Acoustical Fire Guard lay-in units are available in two nominal sizes: 24" x 24" and 24" x 48".

Lift out any units to afford immediate accessibility to the plenum chamber



BRINGS BEAUTY TO A BUILDING'S INTERIOR

The room on the left has an Acoustical Fire Guard lay-in ceiling in the Classic design. The lace-like pattern of tiny perforations gives a smooth, free-flowing effect to the ceiling. Classic has been the most copied design in the history of the ceiling industry — ever since its introduction in 1958 by Armstrong.

Acoustical Fire Guard lay-in units will soon be available in the Fissured design. The attractive fissured surface is a traditional choice wherever ceiling appearance is a primary factor. The fissures resemble the look of travertine marble.

In addition to being an efficient sound absorber, Acoustical Fire Guard—because of its density and composition—can be used with ceiling-height partitions to minimize room-to-room sound transmission problems.

And Acoustical Fire Guard's white surface reflects light evenly, without glare. This ceiling has a light reflectance of "a" (over 75%). The exposed surface of the metal suspension members is available in two finishes—painted white, to match the ceiling boards, and anodized aluminum. Either finish contributes to a modern look for an interior.

Since the Classic and Fissured designs are identical in both the lay-in units and the tile, they can be combined in different areas of the same building.

Architectural designs and renderings by Helmut Jacoby

SPECIFICATIONS FOR Armstrong ACOUSTICAL FIRE GUARD CEILINGS

JOB CONDITIONS

Acoustical materials shall be installed under conditions as outlined in the current bulletin of the Acoustical Materials Association.

SPECIAL CONDITIONS

Armstrong Acoustical Fire Guard shall be installed only by an approved Armstrong acoustical contractor.

MATERIALS

a. Acoustical ceilings shall provide (one, two, three) hours' protection for structural steel as rated by Underwriters' Laboratories, Inc.

b. Acoustical contractor shall submit, as a part of his bid proposal, written substantiation of the rating from Underwriters' Laboratories, Inc.

c. Acoustical lay-in units where specified shall be nominal (24" x 48", 24" x 24") x ⅝" in size. Acoustical tile where specified shall be 12" x 12" x ⅝" in size with interlocking and self-leveling tongue-and-groove edges on four sides. Acoustical units shall have a factory-applied washable white finish with a light reflectance of "a" (over 75%). Acoustical units shall be provided in the following surface detail:

Armstrong Fissured Acoustical Fire Guard—Federal Specifications SS-A-118b, Type III, Class A (Incombustible)—Carrying Underwriters' Laboratories, Inc., Label for Fire-Retardant Classification.

Armstrong Classic Acoustical Fire Guard—Federal Specifications SS-A-118b, Type IIB, Class A (Incombustible)—Carrying Underwriters' Laboratories, Inc., Label for Fire-Retardant Classification.

d. When acoustical lay-in units are specified, suspension system shall be Armstrong Acoustical Fire Guard exposed grid system as shown in the Underwriters' Laboratories listing of the time-design-rated ceilings. Suspension members shall be finished in (white, anodized aluminum) and shall be of the proper dimension to support the size of Fire Guard lay-in units specified. Suspension system shall carry U.L. Inc., Label for Fire Retardant Classification. Where acoustical tiles are specified, suspension system shall be concealed zee system.

INSTALLATION

a. Installation of suspension system. The acoustical contractor shall furnish and install (Armstrong Acoustical Fire Guard exposed grid system, concealed zee system). The system shall be installed in the pattern as shown on the drawings. The system shall be installed in strict accord with the manufacturer's recommendation and in such a manner as to achieve the specified fire-retardant time-design rating. System shall be installed to permit border units of greatest possible size.

b. Installation of acoustical material. The acoustical contractor shall install Armstrong Acoustical Fire Guard in the types, sizes, and surface designs specified above or in the drawings. The acoustical units shall be installed in strict accord with the manufacturer's recommendations and in such manner as to achieve the specified fire-retardant time-design rating.

NOTE:

Complete specifications and detailed working drawings are available from your Armstrong representative or your approved Armstrong acoustical contractor.

Armstrong District Offices

ATLANTA 8, GA.
727 West Peachtree St., N. E.

BOSTON, MASS.
200 First Avenue,
New England Industrial Center,
Needham Heights 94

CHARLOTTE 3, N.C.
1127 East Morehead Street

CHICAGO 34, ILL.
6535 West Irving Park Road

CINCINNATI 37, OHIO
1057 Meta Drive

CLEVELAND 14, OHIO
2975 Superior Avenue

DALLAS 19, TEXAS
2727 Oak Lawn Avenue

DENVER 4, COLO.
35 West Fifth Avenue

DETROIT 26, MICH.
Free Press Building,
321 Lafayette Avenue, West

KANSAS CITY 8, MO.
500 West 26th Street

NEW YORK 16, N.Y.
295 Fifth Avenue

PHILADELPHIA 2, PA.
Robinson Building,
15th and Chestnut Streets

ST. LOUIS 10, MO.
1919 Hampton Avenue

SAN FRANCISCO, CALIF.
1814 Ogden Drive,
Burlingame, Calif.

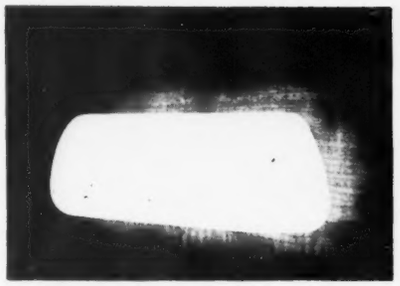
SEATTLE 9, WASH.
221 Minor Avenue, North

CANADA
6911 Decarie Boulevard,
Montreal 29, Quebec

USES: illumination of pictures, corners, tables, buffets, or other desired objects and areas.
SPECS/FEATURES: spotlight and adjustable downlight is capable of casting rectangles, squares and other geometric shapes. Adjustments up to 40° from the vertical may be achieved. Maximum beam diameter is 63° with an aperture opening of 1-½". Model H4170 has four-way frame-in shutters and a projection lens system. The unit operates on one 100 W lamp, six 16-½ bayonet base, DC. Frame is finished in eggshell paint. Over-all frame dimension is 11-¼". Housing dimensions are 10" diameter and 10" deep.
AIA FILE NO. 13-F-21
MFR: HALO LIGHTING PRODUCTS, INC.
Circle 223 for further information

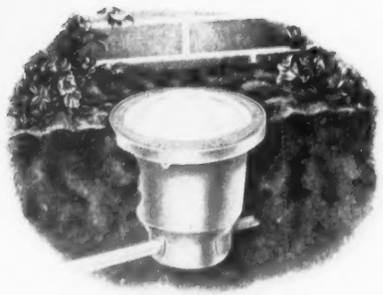
NIGHT-LIGHT SWITCH PLATE

MFR'S DESCRIPTION: a switch plate that will glow with a guiding light for more than five years at a cost of less than five cents a year.
USES: single-toggle switches—homes, offices, hotels, motels, factories, etc.
SPECS/FEATURES: switch plate contains a *Panelescent* lamp that produces enough light to be visible through the white plastic covering on the lamp. When a switch is turned off, the light is immediately activated and provides light. When the switch is turned on, the lamp is extinguished. *Panelescent* lamp produces light over the entire surface of a metal panel by the principle of electroluminescence. Only .025 of an inch thick, the suggested retail price is $2.49.
AIA FILE NO. 31-D-26
MFR: SYLVANIA ELECTRIC PRODUCTS, INC.
Circle 224 for further information



MIRROR LIGHT FOR BATH AND BEDROOM

MFR'S DESCRIPTION: a wall fixture designed primarily as a mirror light offers versatility in bedroom and bathroom applications.
USES: residential and institutional applications.
SPECS/FEATURES: fixture is rated for two 100 W bulbs, can be mounted vertically or horizontally to any standard electrical outlet box, and measures 6" x 17-¾" at 5" deep. Its contemporary glass is hand-blown in satin-finished *Thermopal*, assuring uniform light distribution without hot spots. The glass is hinged so that it can be swung easily away for cleaning or relamping, still held securely to the rest of the fixture while these maintenance operations are taking place.
AIA FILE NO. 31-F-21
MFR: PRESCOLITE MANUFACTURING CORP.
Circle 225 for further information



WEATHER-PROOF OUTDOOR LIGHT

MFR'S DESCRIPTION: a weather-proof fixture for flush installation in earth, concrete, or plaster has been announced.
USES: gardens, around commercial buildings, etc., and various other outdoor installations.
SPECS/FEATURES: all-cast aluminum construction assures maximum corrosion resistance, and the unit is fully sealed to meet all weather and grade conditions. The fixture is designed for 150 W Par 38 flood or spot lamp, sealed beneath a clear-crystal tempered lens. Internal adjustment permits aiming of the lamp in any direction up to 30° off the vertical. Standard unit measures 9" x 9" and is tapped for ½" conduit side entry. Other sizes and entry locations available when specified.
AIA FILE NO. 31-F-22
MFR: PRESCOLITE MANUFACTURING CO.
Circle 226 for further information

SOUND/INTERCOM SYSTEMS

16-STATION HOME INTERCOM SYSTEM

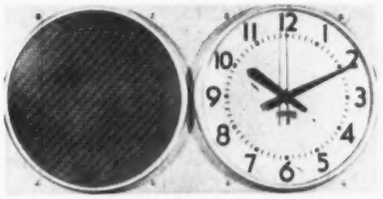
MFR'S DESCRIPTION: 16-station home intercom system is designed to be interchangeable with an eight-station system to provide complete intercom as well as radio facilities for all interior and exterior areas of the home.
USES: nursery monitor, visitor identification, etc.
SPECS FEATURES: system uses no tubes, emits no heat and does not mar or damage walls. Employing a transistor circuit, the system is built to last indefinitely, providing exceptionally dependable and economical performance, mfr states. Units can be flush mounted or surface mounted, making the system adaptable for homes already built as well as for new construction.
AIA FILE NO. 35-i-51
MFR: TALK-A-PHONE CO.
Circle 227 for further information

BACKGROUND MUSIC SYSTEM

MFR'S DESCRIPTION: *Musi-Pak* is a controlled, self-contained background music system.
USES: restaurants, diners, and other public eating places.
SPECS/FEATURES: system utilizes a continuous loop magnetic tape cartridge which plays continuously. No larger than a typewriter, unit can be purchased outright by the user or leased on a monthly basis. User completely controls mood of the music. A microphone input jack facilitates its use for paging, commercial announcements and other inter-business communications. Mfr stresses low cost. There are no federal taxes, no transmission problems, and no outside line interference. Users have at their disposal world's largest cartridge tape library of background music, according to mfr.
AIA FILE NO. 31-i-7
MFR: MUSI-PAK, INC.
Circle 228 for further information

SPEAKER BAFFLES AND GRILLES

MFR'S DESCRIPTION: design of speaker baffles and grilles provides a flush mounting on walls and ceilings, with colors and shapes to harmonize with the decor of interiors.
USES: interior sound systems.
SPECS/FEATURES: speaker unit is mounted by traxion springs, thus eliminating the use of unsightly screws. A further benefit of the spring system is the ease with which the unit can be installed or removed. The grilles are covered with decorator materials especially made to permit unrestricted sound from the speaker. The grill cloth can be cleaned without removing. The designs are square, rectangular and round. They are made to accommodate 5" 8", and 12" speakers. Mounting frames and plaster rings are available so that the units can be installed in either new or existing construction.
AIA FILE NO. 31-i-7
MFR: ROYAL SOUND CO.
Circle 229 for further information



ELECTRIC CLOCK AND SPEAKER COMBINATIONS

MFR'S DESCRIPTION: line of electric clock and speaker units companion-mounted in a common panel.
USES: schools, hospitals, factories, and other institutional and industrial buildings.
SPECS/FEATURES: units are furnished with either round or square dial components. Clock-speaker combinations are engineered for integration with all types of centrally controlled time, program signal, music, or communication systems.
AIA FILE NO. 31-i-24
MFR: THE STANDARD ELECTRIC TIME CO.
Circle 230 for further information

WEATHER-RESISTANT HI-FI SYSTEM

MFR'S DESCRIPTION: a portable, weather-resistant high fidelity loudspeaker system.
USES: indoor and outdoor applications.
SPECS/FEATURES: bookshelf size (9" x 10" x 18") the *Patio Speaker* is constructed of waterproof plywood covered with straw-patterened vinyl and a non-corrosive plastic grille of simulated sea-shell texture. Weighing only 15 lbs., it comes equipped with a built-in carrying handle and a 25 foot length of cable which remain concealed at the back of the unit when not in use. It also features an

← Circle 114 for further information about ARMSTRONG pp 27-38

BRADLEY

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- Models to serve 2, 3 or 5 persons.
- Individual volume and temperature control.
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Circle 115 for further information

PRODUCTS, EQUIPMENT, MATERIALS

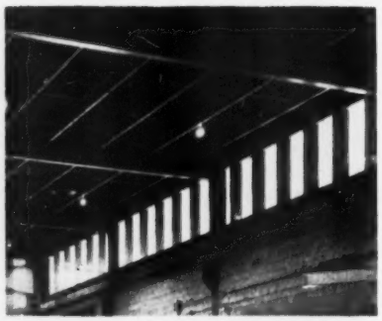
independent volume control knob which allows adjustment of the sound lever without having to go to the amplifier, and comes with a set of detachable legs. Suggested retail price, $59.95.

AIA FILE NO. 31-i-7

MFR: REK-O-KUT CO., INC.

Circle 231 for further information

COMPONENT CONSTRUCTION



TRANSLUCENT FIBERGLASS CURTAIN WALL PANELS

MFR'S DESCRIPTION: *Condo-lux* is a prefabricated, translucent, insulating curtain wall panel.

USES: all types of building framing.

SPECS/FEATURES: panel is designed to be used in conjunction with *Condo-wall*, a metal, insulating curtain wall panel. *Condo-lux* panels provide U-factors ranging from .19 to .26 (about twice the effective insulation of double glazed sash). In-place cost is as little as $2.75 per sq. ft. Consisting of fiberglass reinforced skins with an air insulating core, panels are available in 2", 3", and 4" thicknesses in a standard 32" width, 4' to 12' long. Ribs in the exterior skins are a fluted type, on 4-½" centers; interior ribs are a V-type, spaced to match exterior ribs. Fiberglass boards of 10-½# density are used as structural shear members between the skins. According to mfr, there is no prismatic light infiltration and since skins won't shatter, they eliminate the problem of glass maintenance.

AIA FILE NO. 17-A

MFR: DRESSER-IDECO CO., DIV., DRESSER INDUSTRIES, INC.

Circle 232 for further information

PRE-STRESSED PLASTIC STRUCTURAL PANELS

MFR'S DESCRIPTION: a pre-stressed, long span fiberglas reinforced panel offering structural translucency.

USES: structural.

SPECS/FEATURES: panels are critically engineered and are offered for spans 4' to 30' in single thickness. Pre-stressing fibers are employed in critical tensile areas. Panels require no roofing or sealing of any kind. Resins employed have flame spread of less than 225 and the areas carry the same insurance rating as steel deck panels with asphalt roofing. Available in opaque and translucent colors and silhouette designs. Cost range is $1.50 to $2.50 per sq. ft. in spans up to 15'—spans to 30' approximately $2.50 to $3.50.

AIA FILE NO. 26-A-5

MFR: ARCHITECTURAL PLASTICS CORP.

Circle 233 for further information

HVAC

HIGH CAPACITY AIR CLEANERS

MFR'S DESCRIPTION: model *TFA* is a high capacity, portable electronic air cleaner.

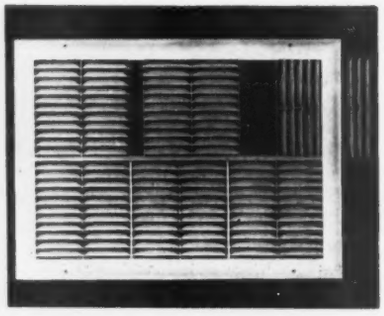
USES: restaurants, cocktail lounges, hotel and motel meeting rooms, offices, or any application when localized clean air is desired.

SPECS/FEATURES: this commercial room unit permits high efficiency electronic air cleaning where lack of ductwork prevents installation of a centralized system. The *TFA* has the capacity to clean the air in a 9,000 cu. ft. room with a complete air change every ten minutes. It will remove smoke, dirt, dust, pollen, and germs from the air, mfr states. In areas larger than 9,000 cu. ft., multiple units may be used.

AIA FILE NO. 30-D-3

MFR: TRION, INC.

Circle 234 for further information



MODULAR TYPE MOLDED RETURN AIR GRILLES

MFR'S DESCRIPTION: an addition to mfr's line of all-nylon registers, grilles, and diffusers, Convert-it return air grilles are unbreakable, non-corrosive, and non-combustible.

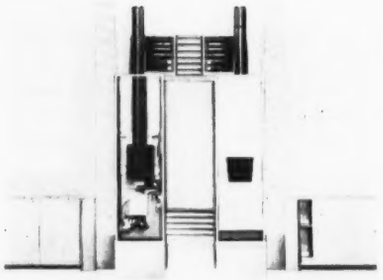
USES: heating and ventilating applications.

SPECS/FEATURES: module sections are injection molded in one piece with vanes set at 30° angle, allowing total free area of approximately 75 per cent based on core area. In grilles larger than 6" square, the modules are mounted in aluminum mullion channels, permitting build-up in 6" increments, in sizes up to 36" x 24". Entire assembly is contained in extruded aluminum "contour" frame assuring rigidity in large sizes.

AIA FILE NO. 30-J

MFR: AIR GUIDE PLASTICS CORP.

Circle 235 for further information



SCHOOLROOM HEATING & VENTILATING SYSTEM

MFR'S DESCRIPTION: *Inn-A-Wall* schoolroom heating and ventilating system is a gas-fired, forced-air installation which is approved by AGA as a counter-flow forced air furnace for use against static pressures up to 50" WC, and for use with temperature rises of 70° to 105° F.

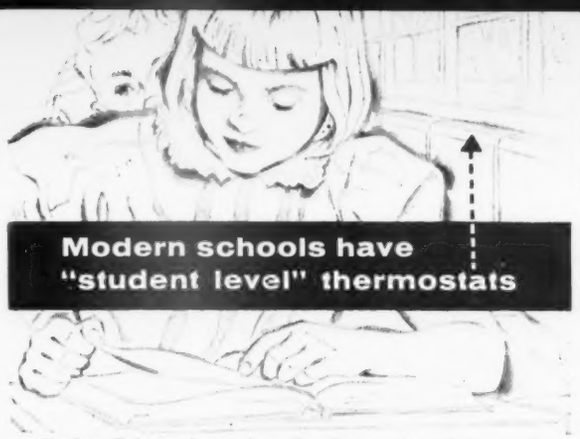
USES: economical installations where the code requires a separate heater room with fire resistant walls, or in a free standing installation in the corner of a classroom.

SPECS/FEATURES: system features automatically controlled dampers for mixing outdoor and indoor air to supply the proper amount of ventilation. Entire classroom distribution system is through handy *Util-i-Duct* bookshelf sections which are installed around the outside perimeter of the classroom under windows. Adjustable filler sections to flush in with wall partitions, and corner sections, are available. A perimeter air diffuser along the top of each bookshelf section has an adjustable damper for balanced air distribution. Available in 80,000/100,000 BTU.

AIA FILE NO. 30-B

MFR: NORMAN PRODUCTS CO.

Circle 236 for further information



Barber-Colman has taken the thermostat off the wall and placed it *inside the unit ventilator enclosure.* Installation costs are less. Improved control accuracy results from the use of the "dual-element" aspirated thermostat principle — same as used in technical laboratories for exacting research work. Maintenance is virtually eliminated. Barber-Colman thermostats have no moving parts and they're unaffected by chalk dust and dirt. Manual adjustment can be made by authorized persons when a change in room temperature setting is desired.

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Circle 116 for further information

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Circle 117 for further information

PRODUCTS, EQUIPMENT, MATERIALS

STORAGE UNITS

WARDROBE UNIT FOR PARAPLEGICS

MFR'S DESCRIPTION: compact unit is low (54" over-all height) and movable on institutional casters.

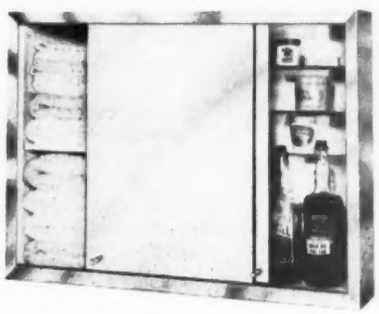
USES: veterans' and general hospitals.

SPECS/FEATURES: the two sections of this single unit provide adequate, easily accessible storage space for clothes and groming supplies. Wardrobe section is equipped with a hanger rod, towel rack, and tooth brush holder. The 36"-high drawer section has three drawers and stainless steel pull-out shelf. The top of the drawer section is plastic and has a chrome-plated guard rail around the back and open side. Both the wardrobe section and the top drawer are equipped with locks which open with a single key. Available in 12 enamel colors.

AIA FILE NO. 35-B-4

MFR: NELLIS INDUSTRIES, INC.

Circle 237 for further information



DOUBLE-SIZE MEDICINE CABINET

MFR'S DESCRIPTION: the *Mercury-Duo*

Lightweight

COMPUTER ROOM FLOORING

EXTRUDED ALUMINUM

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Panels of extruded aluminum construction feature strength and low weight. Combination of pedestals, special extruded aluminum stringers and lateral braces insures a firm and rigid substructure.

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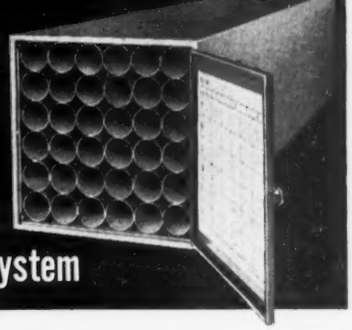
Circle 118 for further information

STACOR Lifetime Steel

Staktube Roll File



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Circle 119 for further information

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the "see-thru" mirror

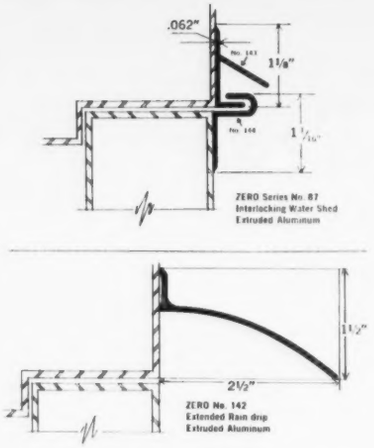
L·O·F GLASS

LIBBEY·OWENS·FORD GLASS CO.
811 Madison Avenue, Toledo 1, Ohio

Circle 120 for further information

Built-in Cabinet, with sliding doors, provides double the normal medicine cabinet storage capacity.
USES: residential and commercial applications.
SPECS/FEATURES: cabinet has a total of 4400 cubic inches. It is 8" deep and is stated to be the largest capacity bathroom cabinet on market. One side has fixed shelves for linen and will accommodate five bath towels, eight face towels, and 12 wash cloths with normal folding. The other side has adjustable glass shelves for medicines and tall bottles. Mirror doors are of polished plate glass or crystal, mounted on nylon bearings. Frames are stainless steel. Available with or without overhead fluorescent lighting fixtures. Rough opening size is 30" x 20". Cabinet is 8" deep and recesses into a standard wall—only 4" extends from the wall. Also available with clear glass doors for use as a first-aid cabinet.
AIA FILE NO. 29-J
MFR: JENSEN INDUSTRIES
Circle 238 for further information

MISCELLANY



WATER SEEPAGE PROTECTION FOR DOOR TOPS

MFR'S DESCRIPTION: protection against water seepage for door tops is stated to be provided by two extruded aluminum products.
USES: out-opening doors in curtain wall construction and metal doors with transoms.
SPECS/FEATURES: *Series #87 Interlocking Water Shed* consists of two extruded members. Upper member, attached to exterior frame of door surface, designed to deflect surface water more than ¾" and an angle hook interlocks with lower member which is affixed to door top. Other unit *#142 Extended Rain Drip*, is single extruded member which channels draining surface water 2½" away from door.
AIA FILE NO. 35-P-6
MFR: ZERO WEATHER STRIPPING CO., INC.
Circle 239 for further information

HAND-LAID BAMBOO WALL PANELING

MFR'S DESCRIPTION: a wall, furniture, and cabinet paneling, sliced and laid by hand from oriental bamboo.
USES: decorative applications.
SPECS/FEATURES: natural light-toned wood has both a delicate vertical grain and unusual horizontal grain patterns. The authentic bamboo veneer, with cross pattern caused by the bamboo joints, forms the face on a solid Lauan plywood core and back. The 8' panels come in 24" width for 3/4" and 32" width for 1/4".
AIA FILE NO. 19-E-6
MFR: GEORGIA-PACIFIC CORP.
Circle 240 for further information

ANTI-FREEZE FOR CEMENT & CONCRETE

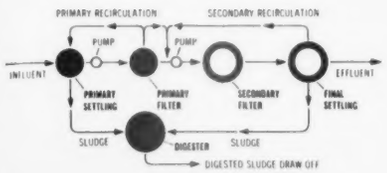
MFR'S DESCRIPTION: a chemically engineered anti-freeze for cold weather construction which allows the laying of brick safely at temperatures reaching 15° F.
USES: concrete construction.
SPECS/FEATURES: *Winter Gard* has an instant heat generating reaction when mixed with mortar or concrete. This heat reaction reduces cure time that results in high early compressive strength. Less gauging water is needed and consequently, there is reduced shrinkage caused by water evaporation. According to mfr, tests show that mortar containing 2 per cent *Winter Gard* have a strength of 15 per cent greater than plain mortar at the end of one year. The nor-

mal seven day strength is reached in three and a half days. Mfr claims that product also improves workability, increases water-tightness, and will not cause efflorescence in the spring.

AIA FILE NO. 3-B-2

MFR: FEDERAL CHEMICAL PRODUCTS CO.

Circle 241 for further information



FACTORY-ASSEMBLED SEWAGE TREATMENT PLANT

MFR'S DESCRIPTION: fully automatic, compact, factory-assembled, *Bio-Pac* two-stage bio-filtration treatment unit is a small-scale version of a big city plant.

USES: subdivisions, schools, motels, factories, trailer parks, resorts, turnpike restaurants, etc.

SPECS/FEATURES: system is available in eight sizes which may be installed singly for populations ranging from 50 to 500 persons or in multiples for larger populations. Units for populations ranging from 50 to 200 persons are shipped assembled from the factory. Units in 250 to 500 person range are shipped in large subassemblies for quick field erection. Full information for computing requirements for any system and selecting suitable unit is available.

AIA FILE NO. 29-C-2

MFR: LINK-BELT CO.

Circle 242 for further information

COLOR ADDED TO GRILLEWORK LINE

MFR'S DESCRIPTION: color is now available in *Filigrille*, styrene ornamental grillework.

USES: interior and exterior applications in commercial and residential buildings.

SPECS/FEATURES: panels and framed assemblies can be factory painted in choice of colors in alkyd resin enamels. Also available is standard metallic paint colors of gold-brass, copper and aluminum. Color can be

Jersey Central Power & Light Co., Morristown, N.J.
Architect: Bernard Kallenyi, Redbank, N.J.
General Contractor: Wm. L. Blanchard Co., Newark, N.J.
Plastering Contractor: E. B. Carley & Co., NYC

NEW
ZONOLITE MONO-KOTE®

FASTER, SAFER FIREPROOFING FOR LOWER COST!

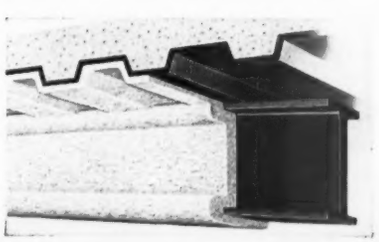
In Jersey Central Power & Light Company's new building at Morristown, N. J., Zonolite Mono-Kote again proves its ability to provide superior fireproofing at lowest possible costs. New Mono-Kote sprays on in one efficient, trouble-free operation. It sets firm, dries fast and fissure-free, and bonds to steel at 340 psi. N.R.C. is up to .55.

Exceptional savings can be realized in construction materials. Inches can often be cut off story height. Scaffold-handling is reduced to a minimum. High-speed application lets other trades go to work in the area days sooner. Also, you will want to investigate how Mono-Kote fireproofing thicknesses beyond building code requirements can provide extra savings in fire insurance rates.

ZONOLITE COMPANY
135 South LaSalle St., Chicago 3, Illinois

Phone or write your Zonolite Representative, or mail the coupon today.

New Mono-Kote sprays on direct to both deck and beam, adheres perfectly to steel without fall-out, withstands humidity and temperature changes.



ZONOLITE COMPANY, Dept. AEN-120
135 S. LaSalle St., Chicago 3, Illinois

☐ Send new Mono-Kote Bulletin PA-53, including fire test data.
☐ Have a Zonolite Representative contact me as soon as possible.
☐ I am interested in Mono-Kote for the following job:

Name:_____
Firm:_____
Address:_____
City:_____ State:_____

Circle 121 for further information

molded into grillework at premium cost on very large orders.
AIA FILE NO. 24-F
MFR: HOLCOMB & HOKE MANUFACTURING CO., INC.
Circle 243 for further information

TRANSFORMERS FOR PAD-MOUNTED APPLICATIONS

MFR'S DESCRIPTION: tamper-proof transformers for pad-mounted applications are now available in 25 to 2500-kva ratings.
USES: residential sub-divisions and shopping centers.
SPECS/FEATURES: the Distribution Transformer Department will furnish single-phase units 25 through 167-kva and three phase units 75 through 500-kva. Three-phase transformers rated from 501 through 2500-kva will be supplied by the Medium Transformer Department. Mfr states that units are completely tamper-proof and accident-proof. No live parts, bolts or other removable accessories are accessible to unauthorized personnel. Both high and low voltage terminal compartments are protected by padlocked doors and are flush with the bottom of the transformer base. Units are designed to be mounted on level concrete foundations with underground connections, eliminating any requirements for a protective fence. Side-by-side arrangement of terminal compartments provides for installation of larger capacity transformers without disturbing incoming or outgoing feeders. Compartments mounted this way are provided with separate hinged doors. As an added safety feature, the fastening device for the high voltage compartment door is situated inside the low voltage compartment. The two compartments are completely isolated from each other by a steel barrier without opening. A single padlock secures the unit from unauthorized entry.
AIA FILE NO. 31-B-3
MFR: GENERAL ELECTRIC
Circle 244 for further information

WEATHER STRIPPING BY ZERO

NEW ASTRAGAL

IDEAS BY ZERO

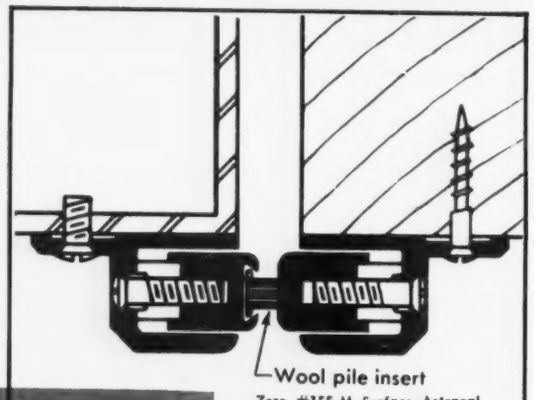
adjustable astragals for meeting stiles

Now available
1. With wool pile insert
2. In extruded aluminum or bronze

Also available in mortised and half-mortised types

- More positive weather seal with long-lasting wool pile insert. Insert is removable.
- Compensates for door expansion and contraction
- Operated by high-tempered springs

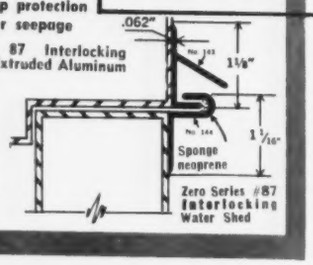
Zero adjustable astragals also available without wool pile.



Zero #155-M Surface Astragal (without wool—#55-M)

New door top protection against water seepage

Series No. 87 Interlocking Water Shed Extruded Aluminum for
- Out-opening doors in curtain-wall construction
- Out-opening metal doors with transoms



These new products, added to ZERO's complete line of saddles and weatherstripping, are shown in FULL SIZE detail in ZERO's NEW 28-Page Catalog. It's packed with important application data and many helpful suggestions.

Write for your copy today!

ZERO Weather Stripping for:
- Windows
- Doors
- Lightproofing
- Soundproofing
- Sliding Doors
- Saddles
- Saddles for Floor Hinged Doors

SEE OUR CATALOG IN SWEET'S

19b-Zer

WEATHER STRIPPING BY ZERO

ZERO WEATHER STRIPPING CO., INC.
453 East 136th St. • New York 54
Phone: LUdlow 5-3230

Circle 122 for further information

COLORED MORTARS FOR BRICK & TILE

MFR'S DESCRIPTION: complete line of colored mortars for use with brick and structural tile.
USES: exterior and interior applications.
SPECS/FEATURES: ten standard colors for blending or contrasting are included in line. Special colors can be custom-blended for large jobs. Colored mortars, pre-packaged to meet any desired specifications, are thoroughly blended and need only addition of water.
AIA FILE NO. 3-L-4
MFR: PRE-MIX CORP.
Circle 245 for further information

BUILT-IN ELECTRIC OVENS AND RANGES

MFR'S DESCRIPTION: line of electric built-in ovens and surface cooking elements designed by Henry Dreyfuss.
USES: residential kitchens.
SPECS/FEATURES: oven features *Roast Guide* which provides clock-controlled baking and roasting simply by dialing the weight of the roast and the time the user wishes it finished. *Custom* models are equipped with a clock and four-hour timer. Other features include full-width heat saver oven doors, fiberglass-insulated, which can be removed for easy cleaning; large ovens which can cook a complete meal for eight; reversible oven racks providing from five to ten different bake and broil positions; and double-stippled porcelain lining bonded to the entire oven and broiler pan for protection and easy cleaning. Line comes in choice of chrome, white, coppertone, woodtone brown, canary yellow, petal pink, and turquoise green porcelain. *Imperial* models come with either a double or single oven, and the *Customs* are equipped with either a single oven or a single oven with warmer below. All surface cooking units have four cooking elements as standard equipment. Element bowls with spill-proof outer edges are removable.
AIA FILE NO. 35-C-11
MFR: WASTE KING CORP.
Circle 246 for further information

AUTOMATIC SPRINKLERS WITH MANUAL OVERRIDE

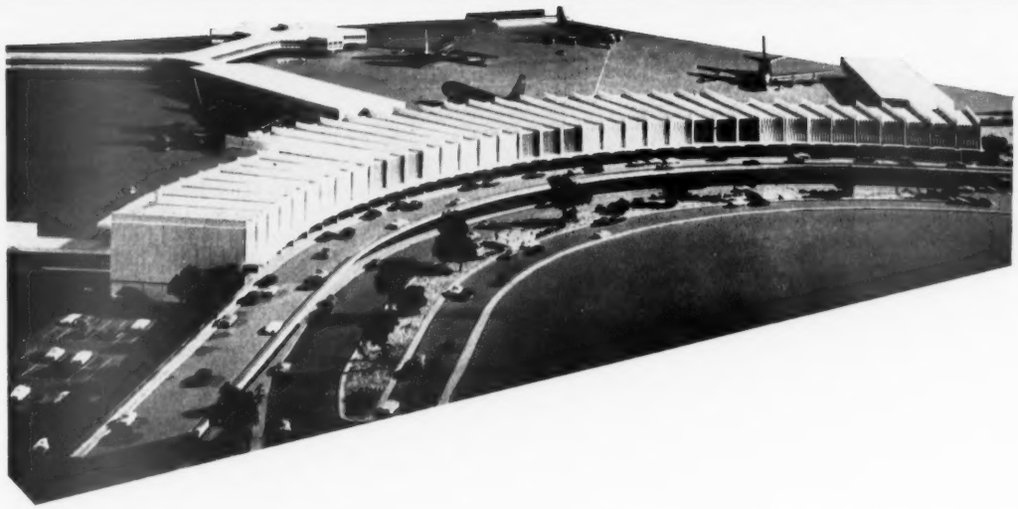
MFR'S DESCRIPTION: sprinkler valve with provision for manual operation.
USES: lawn maintenance.
SPECS/FEATURES: manual override permits watering during construction before an automatic controller is installed. Field tests or unscheduled watering periods may be carried out on any branch of the sprinkler system without affecting the overall automatic program. In use, the valves are normally closed, opening only when actuated by an automatic controller and reclosing at the end of a prescribed time. Use of the manual override, an integral part of the valve, gives independent control at valve location, eliminating the necessity for returning to the controller. Valve is actuated automatically by a hydraulic pilot tube which links it with a hydraulic remote control unit installed at any convenient location. Another model incorporates a solenoid and is controlled by simple wiring from an electrical timing device. Both models are made of rugged bronze and employ O-ring seals and a single moving part with a renewable composition disc to assure quiet, positive closure and long, trouble-free service mfr states.
AIA FILE NO. 38-K-3
MFR: FEBCO, INC.
Circle 247 for further information

ADDITION TO LINE OF METALLIC CHIPS

MFR'S DESCRIPTION: three additional patterns added to line of *Metalflake*, precision cut metallic chips.
USES: decorative applications.
SPECS/FEATURES: sparkling metallic chips are stated to be adaptable to a wide variety of applications ranging from floor and wall coverings to upholstery, etc. Patterns are offered in diamonds, comets, microflakes, staple, squares, rectangles, hexagons, random cuts, and stars.
AIA FILE NO. 15
MFR: THE DOBECKMUN CO., DIV., DOW CHEMICAL CORP.
Circle 248 for further information

THE ANATOMY OF A NEW PROJECT **PREVIEW:24**

SOUTH TERMINAL, SAN FRANCISCO INTERNATIONAL AIRPORT | *project/client*
WELTON BECKET AND ASSOCIATES | *architects/engineers*
JOHN BLUME AND ASSOCIATES | *structural engineers*



General program

The $8 million South Terminal will be the first element to be constructed in Welton Becket and Associates' master plan for the airport adopted by the San Francisco Public Utilities Commission in February, 1959. The plan provides for a central multi-level parking structure surrounded on three sides by three terminals—the existing one on the east and new buildings at the north and south. Evolution of the circular core master plan by the Becket firm came about as a solution to the problem of providing the maximum number of aircraft positions and the maximum number of automobile parking spaces as close to each other as possible.

The new South Terminal is a long, low, curved building, functioning on a two-level plan, and featuring exposed plaster-covered structural steel ribs and different walls of solid panels spaced by narrow slots of clear and colored glass.

Designed to serve American Airlines, Trans World Airlines, Pan American Airways and the International Airlines, the concourses and initial five piers will have 14 large jet gate positions for the present. This will be expandable to 22 jet positions with addition of pier extensions to Pier "F" and Pier "6", which is the international concourse. The international concourse leads to Public Health, Immigration and U.S. Customs facilities on the first level of the terminal.

General features

Design of the new terminal as a curved building was dictated by the traffic flow which suggested the circular shape of the master plan. It also aids in the immediate identification of airline offices. Passengers arriving by roadway on the inside of the curve can see ahead along the entire length of the 800-foot long building and immediately spot the airline they seek. Aesthetically, the interior will appear more intimate from any point within the curve since passengers will see only a part of the structure instead of getting a long, narrow, tunnel-like view. In addition, the curve will give the interior and exterior screen-like walls an ever-changing appearance.

The two-level function of the terminal, in which departing passengers are handled on the upper level and arriving passengers on the lower level, was used for its efficiency in separating traffic and to tie in with the existing terminal building, concourses and piers. The South Terminal will connect to the existing terminal via Pier "E" and attached upper level concourses.

Airline ticket and check-in counters will occupy space on the upper level along the length of the building, broken by high-ceilinged lounges, adjoining restaurant, bar and concession areas. Each ticket counter segment will be located directly adjacent to a concourse entrance leading to the piers where the aircraft will be boarded. In this way, the passenger walks a minimum distance to his aircraft. Additional waiting rooms and restroom facilities will be located in the piers adjacent to each gate position.

Due to the success of second-level telescoping passenger loading devices presently in operation at San Francisco International Airport, all piers are designed to efficiently function with the use of such devices, though access is also provided at each gate via conventional stairs. Concourses and piers are elevated on stilts and feature strip windows along all walls.

Arriving passengers will enter the terminal from the second level piers and concourses and proceed directly to lobby escalators which will carry them to the ground level for baggage claiming. The baggage claiming lobby will be divided into three separate (but connected) areas, each with its own self-claim counter served by automatic conveyor belt. The passenger will proceed to the counter assigned to his airline which will be directly adjacent to the escalator serving the concourse on which he has arrived. From the claim counter the passenger will exit directly to the street level for boarding ground transportation or proceeding to the parking structure.

The three lobbies, one on the center and one halfway down each arm of the curved building, are large, two-story high, open areas which provide a contrast to the narrower terminal spaces adjacent to the ticket counters. The lobbies on either side feature passenger waiting lounges which have clear glass views of the airfield, the clear glass being a repeat of the counter part over the lobby entrances. The central lobby leads directly to the passenger concourse, the restaurant and the cocktail lounge. Each lobby will have a two-way escalator serving the lower level.

Ticketing counters will be uniform, with a back-lit translucent colored-plastic marquee above each, carrying the name of the airline. Office space for each of the airlines will be located behind the respective counters.

A future mezzanine floor will be located above the ticket counter and office area, featuring a gallery open to the main floor and space for shops and offices. Provisions have been made in the design for these future mezzanine offices. Mechanical rooms for air handling equipment are located in a mezzanine over the restaurant and cocktail lounge, which results in a desired lower ceiling for these areas.

All public restrooms are located in the ground level, directly adjacent to the escalators and stairs. By locating all of these facilities on one level, the architects have attempted to provide a more even utilization and ease of maintenance.

The master plan calls for pedestrian underpasses to be constructed to the parking structure from the lower level, and pedestrian overpasses to be constructed from the upper level.

Structural notes

The terminal's lower level will be of reinforced concrete construction up to and including the upper level floor. The wall at the lower level will consist of floor-to-ceiling glass panels adjacent to the entrances alternating with panels faced with mosaic tile. The sidewalk is protected by a canopy formed by the cantilevered upper level roadway.

The frame of the upper part of the building is of fireproofed steel construction which featured 8-foot thick trusses up to 130 feet long spanning the width of the public lobby. The plaster-covered trusses extend like ribs up the sides of the second floor of the building above the roadway and continue across the top.

A continuous marquee runs the length of the building protecting the sidewalk. The marquee features a square dip at each of the building's structural ribs. Below the marquee, the entire facade is glass punctuated by entrances with automatic door openers at regular intervals. Above the marquee, the wall is composed of plaster-faced panels alternating with narrow vertical strips of colored glass in a brick-like staggered fashion. Panels are separated from the structural columns by strips of clear glass, once again emphasizing the structure. At night this treatment will cause the panels to appear to be floating free of the columns by virtue of the interior lighting which will give a righly colored effect through the narrow colored glass slots. Conversely, the same effect will be created within the interior of the terminal in the day as sunlight beams through the colored glass. The south wall, facing the field, will be constructed in a similar manner, with the unique wall acting as a sun screen.

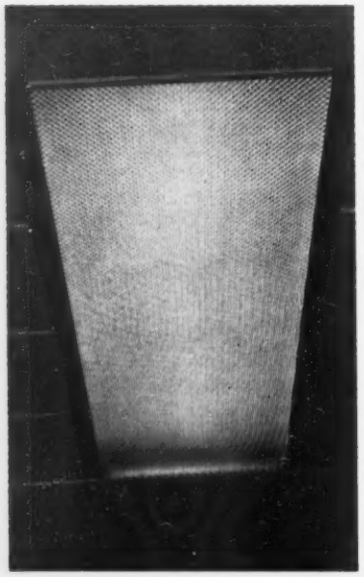
The wall sections directly above the three main entrances feature huge panes of clear glass instead of the panel treatment. These areas provide abundant outside light to the three main lobbies on the interior, reached from the outside through a glass-enclosed vestibule, covered by interior canopies.

Area and costs

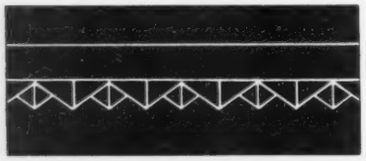
Total gross floor area	307,770 sq. ft.
Total volume	6,006,404 cu. ft.
Estimated cost	$8,000,000

AIA BUILDING TYPE NO. 1 air transportation, including airports, air terminals, hangars and ticket offices

Here's an
IDEA
for architects
who want
brightness
without glare



This is Crystal Pattern No. 70. It couples very low surface brightness with a very great capacity for delivering the most light to where it does the greatest good. We've accented the cross section to show how Corning designers accomplished this.



If you need abundant general illumination for offices, schoolrooms or display areas, Crystal No. 70 makes a brilliant solution. Write for complete data. Lighting Sales Department, 30 Crystal Street, Corning, N. Y.

CORNING GLASS WORKS
CORNING MEANS RESEARCH IN GLASS

Circle 123 for further information

LITERATURE

Literature cited in this department is available from various manufacturers and associations free of charge, except where indicated. To obtain copies, circle the keyed numbers on the reader service cards facing pages 1 and 60.

LATHING AND PLASTERING

Manual of Lathing and Plastering by John R. Diehl, AIA, of Diehl and Stein, Princeton, N. J. architectural firm, is stated to be the most complete and definitive work ever devoted to the subject. Opening chapter on "Architectural Considerations" includes an essay on the use of plaster in architecture by Charles W. Moore, Associate Professor, College of Architecture, University of Southern California. Other chapters cover basic plastering materials, lathing and the preparation for plastering, the application of plaster, an analysis of the various wall and ceiling systems and assemblies, functions and quality of plaster work, economics of lath and plaster (including a handy basic cost index), acoustical and thermal characteristics, radiant heating, and a complete chapter on fire resistance. Inquiries regarding the manual and its availability (a substantial no-charge distribution is scheduled) may be directed to Mr. John K. Buster, Executive Director, National Bureau for Lathing and Plastering, 2000 K Street, N. W., Washington 6, D. C.

AIA FILE NOS. 20-B, 21

ASSN: NATIONAL BUREAU FOR LATHING AND PLASTERING

WRITE MANUFACTURER DIRECTLY

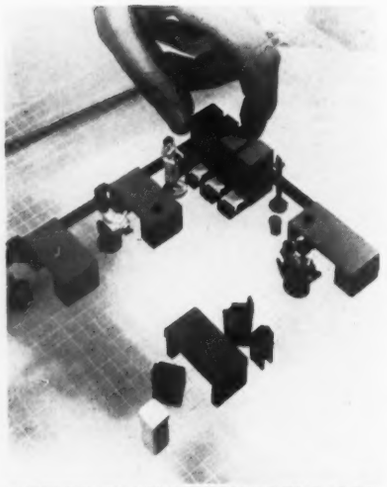
SUPPLY COMPANY CATALOG

Equipment Catalog and Hydraulic Reference Manual is now available. Government and industrial surplus products are illustrated and described with engineering specifications, technical drawings, suggested usages, etc. Catalog covers electrical, hydraulic and mechanical items used for original manufacture or maintenance in every industry. Included are air compressors; diesel parts; fluid and gas pressure tanks; generating plants AC-DC; hoists; hydraulic control valves, cylinders, gauges, motors and pumps; superchargers; ventilating blowers; etc. (64 pp.)

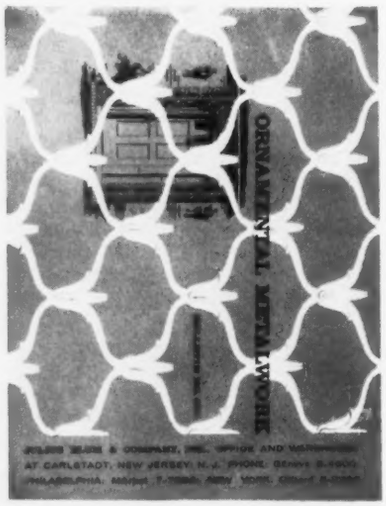
AIA FILE NO. 35-i

MFR: GROBAN SUPPLY CO.

Circle 300



OFFICE PLANNING MODELS 302



ORNAMENTAL METALWORK

Ornamental Metalwork, bulletin *No. 071*, now available, is intended to provide help in the selection and design of attractive ornamental metalwork. It includes many scale drawings of suggested designs fabricated from stock malleable iron ornamental castings, and suitable for railings, columns, balustrades, gates, fences, verandas, space dividers, etc. Architectural drawings of typical installations are also included, together with information about the material, production, relative cost, and quality. (20 pp.)

AIA FILE NO. 15-C-1

MFR: JULIUS BLUM & CO.

Circle 301

OFFICE PLANNING MODELS

Catalog and price list covers 148 three-dimensional scale models including various sizes of desks, chairs, file cabinets, business and calculating machines of many of the well known mfrs. Grid boards, wall sections, columns, and scale figures of office personnel are also available. Items can be purchased individually or in kit form. (4 pp.)

AIA FILE NO. 41

MFR: VISUAL PLANT LAYOUTS, INC.

Circle 302

CURTAIN-WALL PANELS

Full color booklet describes porcelain enamel curtain wall panels. Full specification information is given on 16 standard types of panels. Included is a discussion on the advantages of curtain wall construction. Photographs of typical installations including schools, business offices, medical centers, and municipal buildings are also shown. Booklet also describes *Ridgi-Cal* building material, a porcelain enameled corrugated steel in standard sizes in a variety of gauges and colors. The material can be used for roofing, siding, schools, factories, and other buildings. Profile drawings of six typical *Ridgi-Cal* panels are shown. (8 pp.)

AIA FILE NO. 17-A

MFR: ARCHITECTURAL PORCELAIN ENAMEL DIV., CALORIC APPLIANCE CORP.

Circle 303

SEWAGE TREATMENT

Bulletin No. *7315* describes *Comple-Treator* unit which provides complete sewage treatment in a single tank, using modern, mechanized sanitary engineering methods for disposal of domestic waste of 150 persons (15,000 gpd) or less, or the population equivalent. Mfr states that the unit

provides modern sanitary engineering practice regardless of how small the sewage flow. By combining five distinct operations in a single tank, the unit cuts construction costs and conserves space. Unit is delivered at site, wired and completely assembled, ready for installation on prepared foundation in as little as two hours, mfr states. Only attention required is lubrication and brief inspection which may be at intervals of from once a day to once a week. No special training or special testing is required for successful operation. (8 pp.)

AIA FILE NO. 29-C-2

MFR: DORR-OLIVER INC.

Circle 304

GLASS BLOCKS

PC Glass Blocks and Sculptured Glass Modules contains background information on glass blocks and features the sculptured glass module. The design flexibility and functional advantages of glass blocks and modules are discussed along with a full-color spectrum showing the eleven colors in which color glass blocks and modules are available. Also included is technical data on light transmisison, insulation value, physical performance and proper selection of block. Information on how to install glass blocks is included, along with application specifications and accessory materials. Four pages are devoted exclusively to detail drawings of typical glass block elevations and sections, and their construction. (20 pp.)

AIA FILE NO. 10-F

MFR: PITTSBURGH CORNING CORP.

Circle 305

INDOOR CLOCKS

Bulletin describing indoor electric clocks now available. Line includes round dial clock with modern numerals; 24-hour clocks which indicate both local and Greenwich Meridian time. Advertising clocks and custom clocks are also included. (4 pp.)

AIA FILE NO. 31-i-23

MFR: ELECTRIC TIME CO.

Circle 306

PLANNING & DESIGN

SPACE-SAVING FURNITURE

Making Multi-Purpose Use of Space is illustrated guide said to help business firms meet the continually rising cost of commercial floor areas. To achieve this, some of the many multi-purpose room arrangements possible with a partitioned area only 18′ x 30′ and mfr's line of folding tables are illustrated. One arrangement shows how as many as 50 people can be comfortably accommodated in this limited area. Another points out how two separate conferences of 16 people each can be held simultaneously merely by rearranging tables and using folding partitions to divide the space into two rooms. Catalog includes information on the *Mobil-Matic*, folding, mobile conference table that is available in three shapes, seats up to 14 people comfortably. (10 pp.)

AIA FILE NO. 28-A-7

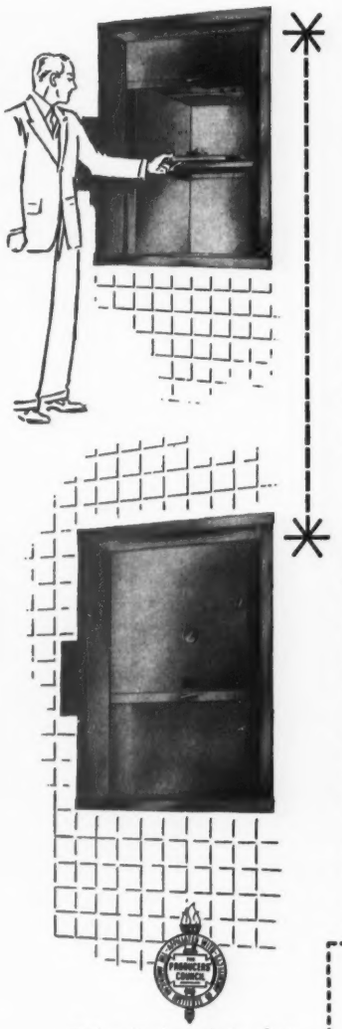
MFR: HOME FOLDING FURNITURE, INC.

Circle 307

STEEL FRAMING

Availability of design manual containing complete structural analysis of *V-Lok* framing has been announced. *V-Lok*, a system of interlocking steel framing, is graphically illustrated and explained. Details on standard columns, girders, and purlins, specific design considerations, design feature for external and internal wind forces, seismic loads, and expansion joints are included. Other features include methods for determining purlin sizes required to carry combined uniform and concentrated loads. A structural analysis of a sample frame is provided. A 14-page load table section is included which features purlins, girders, columns, and steel roof deck. Seven pages of typical details for offices, industrial and commercial buildings, and schools showing roof framing plans, temporary walls for future expansion, curtain and window walls, masonry-bearing purlins, wall sections with vertical and horizontal siding and

Concentrate Responsibility...



Specify SEDGWICK **Dumb Waiters** and SEDGWICK **Dumb Waiter Doors**

When you select a Sedgwick Dumb Waiter, you get a *completely* integrated installation — including dumb waiter doors — designed, engineered, manufactured and installed by Sedgwick.

This places the responsibility for the entire installation in the hands of *one* supplier — cutting in half the red tape, contracts and approvals, and eliminating your coordination of door and dumb waiter design and erection. Furthermore, all equipment is shipped at the same time, saving shipping and handling costs. The same mechanics install both doors and dumb waiters.

Sedgwick Dumb Waiters and Doors are available in a complete range of modern, improved types and standard sizes that can be adapted to fit requirements exactly.

(See standard specifications and layouts in SWEETS 24o/Se

Doors are manufactured in bi-parting, slide-up, slide-down or hinged arrangement. Also access and clean-out doors. (Underwriters' Labelled where required.) *Send today for complete literature and specifications.*

Other Sedgwick Products

★ SIDEWALK ELEVATORS
★ FREIGHT WAITERS
★ RESIDENCE ELEVATORS
★ "STAIR-TRAVELORS"

NATIONWIDE SERVICE

Sedgwick MACHINE WORKS

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☐ Please send general information
☐ Please send specific recommendation

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ADDRESS _____

CITY _____ STATE _____

Circle 124 for further information

LITERATURE

glass fronts are also included. Another seven page section, including load tables, features *Allspans* from 8 to 120 feet. (48 pp.)
AIA FILE NO. 13-G
MFR: MACOMBER, INC.
Circle 308

LEAD SOUND BARRIERS
Engineering report explains in detail how to calculate the effectiveness of a partition or sound barrier. Booklet treats building walls, movable office partitions, machinery enclosures, and other sound-containing structures. In addition to showing the sound transmission characteristics of a number of conventional wall constructions, the report includes calculation methods applicable to most simple partitions. Noise criterion charts are also included so that reasonable sound level targets can be set. (12 pp.)
AIA FILE NO. 39
ASSN: LEAD INDUSTRIES ASSN.
Circle 309

PIPING FLEXIBILITY
Booklet that describes computer service for piping flexibility analysis announced. Using simplified do-it-yourself input feature, service provides analysis within 24 hours or less. Step-by-step report on analysis of three-anchor system and two two-anchor systems is outlined in booklet. (12 pp.)
AIA FILE NO. 29-A
MFR: THE SERVICE BUREAU CORP., SUBSIDIARY OF INTERNATIONAL BUSINESS MACHINES
Circle 310

BATHROOM DESIGN
Formica Bathrooms illustrates five bathrooms in full color showing applications of laminated plastic. Laminates are shown on walls as well as *Vanitory* tops. Wall tile in woodgrains, patterns and solid colors is featured.
AIA FILE NO. 23-D
MFR: FORMICA CORP., DIV., AMERICAN CYANAMID CORP.
Circle 311

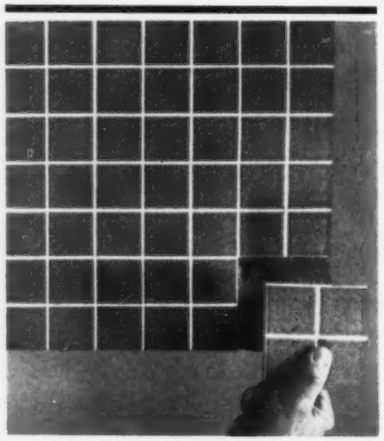
INCINERATOR SELECTION
Pocket size incinerator selector is said to simplify selection of correct incinerators for various types of installations. In appearance and operation it is somewhat like a slide rule. Type and size recommendations can be determined for apartment houses, snack bars, cafeterias and restaurants, clubs, department stores, hotels and motels, hospitals, institutions, supermarkets, office buildings, schools, warehouses, etc.
AIA FILE NO. 35-J-41
MFR: MORSE BOULGER, INC.
Circle 312

FLOORING

STAINLESS STEEL FLOOR PLATE
Booklet about stainless steel floor plate describes the safety and economy features of product. Form No. *152* illustrates applications and includes "Safe Uniform Load" tables, types available, and specification tables. A companion brochure, No. *153*, illustrates typical examples of product in use.
AIA FILE NO. 15-H-1
MFR: EASTERN STAINLESS STEEL CORP.
Circle 313

FLOORING AND TRIM
Fully illustrated brochure describes line of hardwood flooring and trim, the plant that produces them, flooring installations, specimens of panelling and listings of Northern hard maple flooring uses. A colored map pinpoints company's location in Upper Mich. (6 pp.)
AIA FILE NO. 19-E-9
MFR: HOLT FLOORING DIV., AHONEN LUMBER CO.
Circle 314

TILE



SCORED TILE
Current booklet covers additions to products in line of scored tile. A complete selection of scored tile *Trim Shapes*, now available for the first time, for both conventional mortar installations and for adhesive and thin-set mortar installation, is included. There is also a chart of standard scored tile patterns, showing wide range of effects possible. In addition, the booklet announces the introduction of *SD-5* which is unusually adaptable for combination with both scored and unscored tile in many interesting effects. (4 pp.)
AIA FILE NO. 23-A
MFR: AMERICAN OLEAN TILE CO.
Circle 315

TILE HANDBOOK
Handbook covering all phases of *Thin-Set Adhesive* method of installing genuine clay tile has been published. Accompanied by numerous illustrations and diagrams, complete details are given for application of wall tile, ceiling tile, exterior tile, and floor tile (above, below and on grade). There is a complete listing of suitable surfaces together with special recommendations in connection with each, plus diagrams of techniques of setting new tile over old tile, over badly damaged old plaster, etc. Floor construction over uneven concrete or wood base, shower stalls, cooler rooms, flush wainscot on masonry, patterns and borders, and exterior masonry installations are other categories dealt with extensively. Important consideration is also given to applications of tile work on dry-wall panel materials. Full line of products for leveling, priming, setting, grouting and caulking, as well as adhesives for special applications involving high temperatures, chemical resistance and high strengths, are described in detail together with recommended usage. Publication also supplies contractual and legal specifications for use in this work, together with "short form specification" which provides for legal inclusion of handbook itself as part of job contract, if so desired.
AIA FILE NO. 23-P
MFR: MIRACLE ADHESIVES CORP.
Circle 316

PLASTICS

FIBERGLASS PANELS
Complete technical data and product information is provided in brochure stated to be most comprehensive in the fiberglass reinforced plastic panel industry. The brochure incorporates full testing details and conclusions about *Filoplate*, a recently developed panel structurally guaranteed for the lifetime of any installation, and specifications for *Roloite*, cross-corrugated panel in roll form. It includes general specifications for entire line of corrugated, flat, glazing and decorative panels; heat and light transmission values, load carrying charts, illustrated construction details, and a "how to specify" section. (8 pp.)
AIA FILE NO. 26-A-9
MFR: FILON PLASTICS CORP.
Circle 317

PLASTIC FOAM INSULATION
Publication is announced of heat loss values for three plastic foam insulations. Each chart lists values by type of comfort application and thickness of foam. Values are expressed in both watts and U factors. Values charted are for *Roofmate*, for use under build-up roofs; *Syrofoam*, for insulation on masonry walls and in cavity walls; and *Scorbord*, for perimeter insulation. (2 pp.)
AIA FILE NO. 37-A
MFR: DOW CHEMICAL CO.
Circle 318

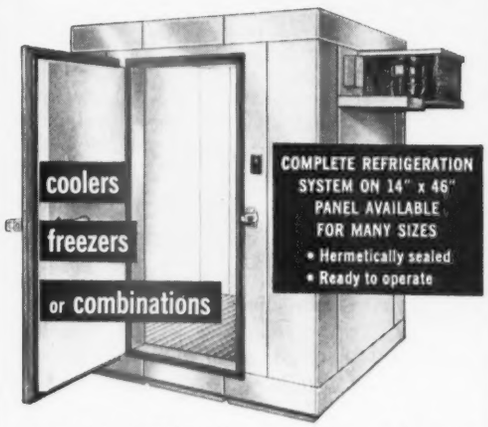
LAMINATED PLASTIC GUIDE
Selector-Visualizer is complete guide to mfr's laminated plastic engraving stock for signs, nameplates and specialty items. Pocket-size folder shows the nine colors and patterns stocked for immediate delivery, including new Signal Red, Brown, and Prima Vera woodgrain. Charts give at-a-glance information on finishes thickness, sheet sizes, properties, plus a listing of coast-to-coast fabricating facilities. Printed acetate overlay enables user to visualize finished appearance of engraved laminate.
AIA FILE NO. 24-C
MFR: FORMICA CORP., DIV., AMERICAN CYANAMID CO.
Circle 319

PLASTICS CATALOG SHEET
Catalog sheet covering white Opal K-4 and K-5 polystyrene prismatic lens panels now available. Sheets are complete working tool for architect and lighting engineering showing products, available sizes and complete brightness data charts, distribution charts and coefficients of utilization. Sheet is indexed to fit into natural sequence of master catalog.
AIA FILE NO. 24
MFR: K-S-H PLASTICS, INC.
Circle 320

EPOXY FLOOR SURFACER
Recently published literature describes faster, less expensive way to protect and renew concrete and wood floors with epoxy plastic. For all except completely decomposed floors which require rebuilding or trowelled on overlay, the new application of *Epo-Floor-Top* with foam rubber roller offers much faster, more economical method of making floors chemical and abrasion resistant. Re-

Bally walk-ins

Aluminum or steel sectional construction



Sanitary! Strong! Efficient! You can assemble any size cooler, freezer or combination in any shape from standard sections. Add sections to increase size as your requirements grow. Easy to disassemble for relocation.

ARCHITECTS: see 8 pages of engineering data in Sect. 26/A of Sweet's Catalog.

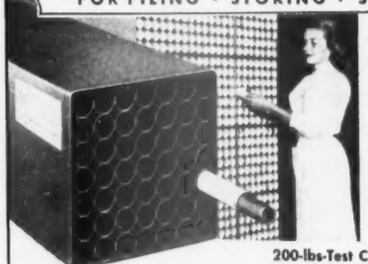
Bally Case and Cooler, Inc., Bally, Pa.

Get details—write Dept. AN-12 for FREE book.

Circle 125 for further information

MULTIROLL FILES

FOR FILING · STORING · SEGREGATING



TRACINGS
BLUE PRINTS
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Depth	11¼"	22¼"	30½"	36½"	42¼"
49 Tube Model 1¾" I.D.	49AB $7.50	49CD $9.50	4930 $12.80	4936 $13.80	4942 $14.80
25 Tube Model 2¼" I.D.	25AB $7.00	25CD $9.00	2530 $11.80	2536 $12.80	2542 $13.80
	Shipping Weight				
Model 49	8 lbs.	12 lbs.	15 lbs.	18 lbs.	20 lbs.
Model 25	6 lbs.	10 lbs.	13 lbs.	15 lbs.	17 lbs.

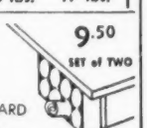
Sold in Sets Only—2 JR36 Per Set

ENAMELED MED. GRAY

JR 36

DESIGNED TO MOUNT UNDER BOARD MOUNTING BRACKETS FURNISHED.

9.50 SET of TWO



8 lbs. Shp Wt.

F.O.B. St. Clair Shores, Mich. • PRescott 3-2515 • *SOLD DIRECT ONLY*

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ROLL & FILE SYSTEMS, INC. - P.O. BOX 3863, DETROIT 5, MICH.

Circle 126 for further information

LITERATURE

sistance ratings against 56 troublesome chemicals are given in literature, and also an invitation to send for a no-risk trial quantity package for test application.

AIA FILE NO. 24-B

MFR: STEELCOTE MANUFACTURING CO.

Circle 321

COATINGS/SEALANTS

THIOKOL-BASE SEALANTS

A report on the results of an independent laboratory study of Thiokol-base sealants has been released. This study, conducted by the National Testing Laboratories of New York, evaluates six brands of Thiokol-base sealants against *Sonolastic Sealant* in a series of comparative tests to determine these three essential performance characteristics; longevity of service, absorption of joint movement, thermal stability at sub-freezing temperatures. The test used for determining longevity was the change of Shore "A" hardness with accelerated weathering. Absorption of joint movement was measured by tension elongation before and after accelerated aging. Thermal stability and elastic recovery properties were determined at temperatures from 32° F. to minus 50° F. Graphs and charts of the comparative test results, as well as suggested specifications for a high quality, long lasting sealant are included.

AIA FILE NO. 24-A

MFR: BUILDING PRODUCTS DIV., SONNEBORN CHEMICAL AND REFINING CORP.

Circle 322

LEAKAGE IN BRICK WALLS

Why The Finest Brick Walls Leak is a fully illustrated catalog which covers in a simple treatment the causes, effects, and corrective measures to be taken by the use of *Horn Hydratite Plus*. Description, use, method of application, and specifications are included. (8 pp.)

AIA FILE NO. 5-M

MFR: A. C. HORN COMPANIES, DIV., SUN CHEMICAL CORP.

Circle 323

ADHESIVES/COATINGS/SEALERS

Current catalog *A-ZBD-102-JR* contains eight fold-out tables listing the uses, characteristes, and general properties of over 170 different adhesives, coatings, and sealers. The catalog is designed to help select the proper adhesive, coating, or sealer for a specific application and to help determine similarities and major differences between products having the same general base material. A

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Rock-it
Roll-it
Press-it

THE ALL-NEW

P&S® ROCKER-GLO SWITCH

... the switch that *looks* right, *feels* right and *is* right for every type of wiring job.

Here is the one switch with the most wanted features on the market today.

The merest touch causes instant, silent action ... and Rocker-Glo glows in the dark.

Available in Despard and narrow rocker types.

Write for brochure, Dept. AE-126

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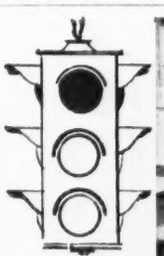
Circle 127 for further information



STOP BACKWATER INSTANTLY! COMPLETELY!

Josam BACKWATER VALVES

The basement in almost every home and building is subject to the ravages of backwater if a flood due to rain or snow is heavy enough to cause sewers to back up. Most insurance does not cover the damage. The way to provide complete protection is to install a Josam Backwater Sewer Valve — permits constant drainage from building to sewer yet prevents the entry of any backwater or sewage into basement. Recommend them on every job — your customers will thank you for the suggestion!

Series No. 1170-T

Write for Manual BW on "Backwater".

JOSAM MANUFACTURING CO.

Dept. AN-12 Michigan City, Indiana

West Coast Distributors: JOSAM PACIFIC CO., 765 Folsom St., San Francisco, Calif.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

Circle 128 for further information

LITERATURE

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AIA FILE NO. 24-A
MFR: ADHESIVES, COATINGS AND SEALERS DIV., MINNESOTA MINING AND MANUFACTURING CO.
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AIA FILE NO. 24-B
MFR: MAGNA-BOND, INC.
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AIA FILE NO. 3-B-1
MFR: SILICONE PRODUCTS DEPT., GENERAL ELECTRIC
Circle 326

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AIA FILE NO. 40-B-4
MFR: THIOKOL CHEMICAL CORP.
Circle 327

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AIA FILE NOS. 3-A 4-P, 23-D
MFR: AMERICAN SYNTHANITE CORP.
Circle 328

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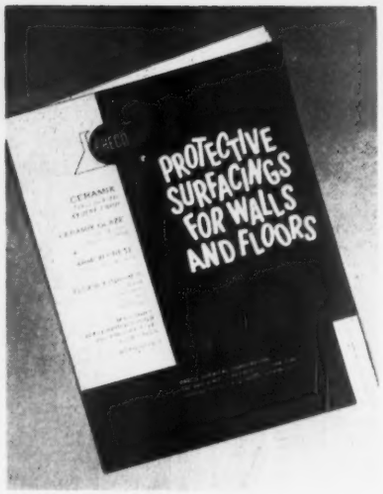

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MFR: BUILDING PRODUCTS DIV., PRECO CHEMICAL CORP.
Circle 330

SOUND/PHONE SYSTEMS

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AIA FILE NO. 31-i-7
MFR: DUKANE CORP.
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AIA FILE NO. 31-i-5
MFR: THE DUKANE CORP.
Circle 332

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AIA FILE NO. 31-i-7
MFR: HIGH FIDELITY PRODUCTS DIV., NORTH AMERICAN PHILLIPS CO., INC.
Circle 333

HVAC

WOOD COOLING TOWERS

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Circle 129 for further information about ANACONDA ▶

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A new edition of our book, "Architectural Metals by Anaconda," is just off the press. In its 64 pages are practical information and data on the architectural applications of copper, brass, bronze, and nickel silver—plus many new outstanding examples, with fabricators' detail drawings. Send for your copy today. Write: Anaconda American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.

G024

Architects: Belli and Belli, Chicago. Fabricator of grille: Greco Manufacturing Co., Chicago.

▼ **General view** of the altar and grille in St. Williams Church. The reredos is Venetian glass mosaic.

▲ **St. Williams Church, Chicago.** Pastor, Rt. Rev. Msgr. Paul F. Loeffel. A close-up view of the grille of circular design which provides a background for the altar screen. It is 46′ wide by 35′ high and made entirely of bronze. The circles are 3″, 6″, 9″, and 12″ in diameter, riveted together. The 3″ circles were cut from bronze tube. The larger diameters were roll-formed from standard rectangular bronze rod, ¼″ thick by 1″, 2″ and 3″ wide. After the circles were formed, the ends were joined by silver-alloy brazing. The outside of each circle was bright-finished and the inside painted with one of the five liturgical colors in pastel shades.

BRONZE—The Architectural Metal of Distinction

ANACONDA®

ARCHITECTURAL METALS

Anaconda American Brass Company

Outstanding tallations...

el illumination
he usual painful glare"

itement from Mr. Irving M. Addis, chitect, reporting on the illumination new offices for La Salle Casualty ., Chicago, Illinois.

throughout the entire area is 4 set into a flush mounted acousti-. The illumination level of 130 s met without difficulty... The in-roved to be extremely satisfactory tive as well as illumination stand-ersonnel and management like the mination without the usual painful one is to be congratulated on the e fixtures and the complete co-staff.

Irving M. Addis

Irving M. Addis, Architect

o receive favorable notice of products pliments take on special significance n knowledgeable sources....Added ophane engineers toward new and g achievement.

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New York 17, N. Y.
PLING AVE. SO., TORONTO 18, ONT.

LITERATURE

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MFR: ADHESIVES, COATINGS AND SEALERS DIV., MINNESOTA MINING AND MANUFACTURING CO.

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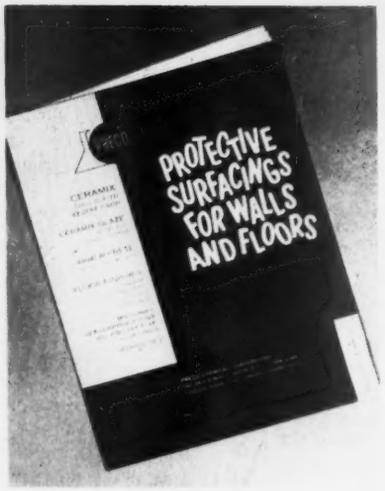

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MFR: BUILDING PRODUCTS DIV., PRECO CHEMICAL CORP.

Circle 330

SOUND/PHONE SYSTEMS

Sound
TEMS for SCHOOLS
* Designed to meet all school sound requirements
* High quality sound reproduction
* Modular construction provides for future expansion
ST. CHARLES, ILL.

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MFR: DUKANE CORP.

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MFR: THE DUKANE CORP.

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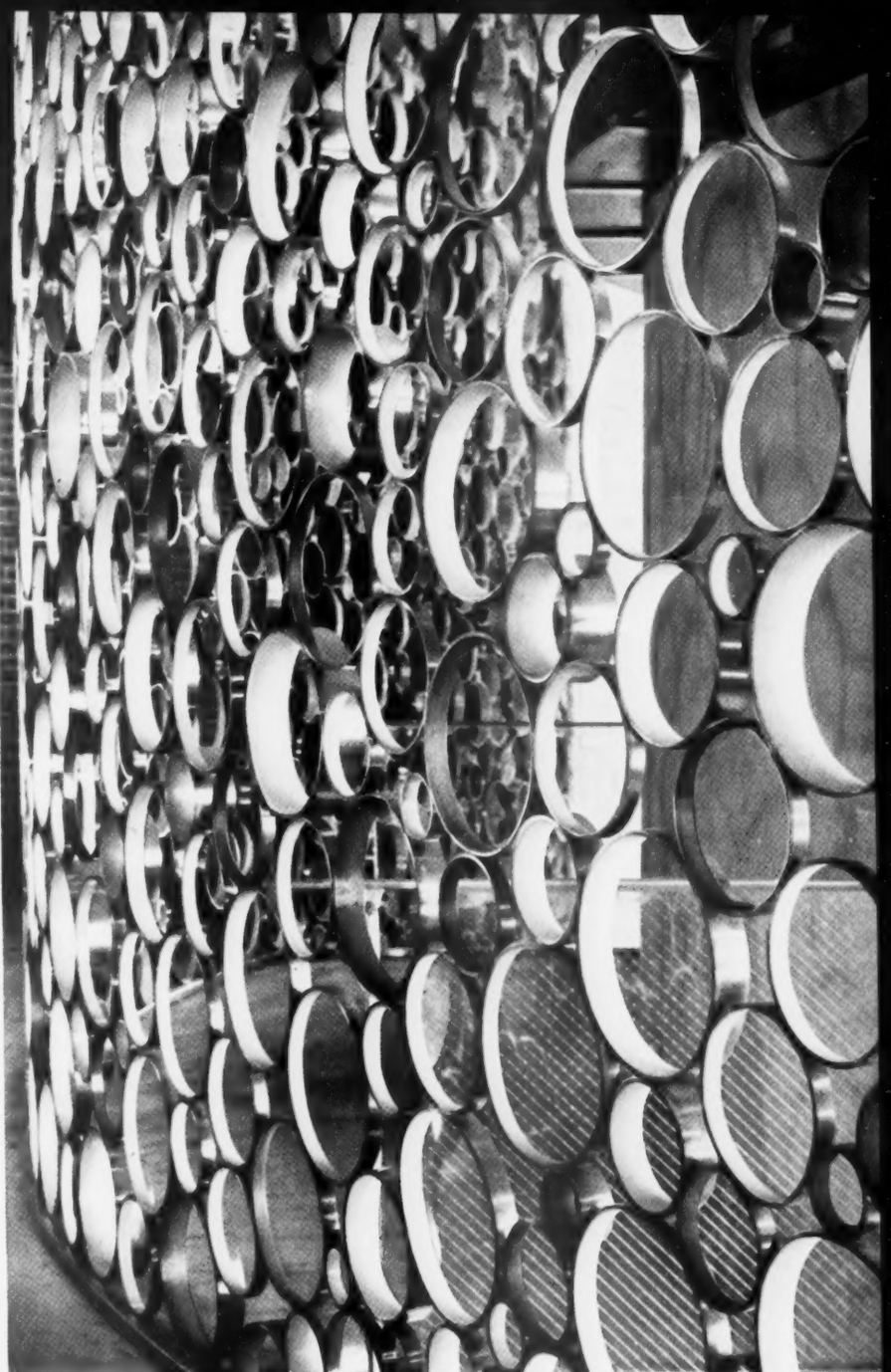
The architect has practically a free hand in designing for bronze. The range of standard alloys and economical forms available—sheet, rod, tube, and extruded or drawn architectural shapes from stock dies—offers an almost limitless variety of texture, form, and warm, rich colors to translate architectural concepts into reality. The grille, at the right, is an excellent example of imaginative design employing standard shapes, principally rectangular bronze rods. (See fabricating details below photograph.)

Bronze is easily formed to match design details accurately and the components may be joined mechanically or by soldering, brazing or welding. In finishes, the designer also has a wide choice. The beauty of bronze is unequaled whether it is maintained in a bright finish, the ebony statuary bronze hue, or the soft, gray-green patina acquired by natural or artificial "weathering."

A new edition of our book, "Architectural Metals by Anaconda," is just off the press. In its 64 pages are practical information and data on the architectural applications of copper, brass, bronze, and nickel silver – plus many new outstanding examples, with fabricators' detail drawings. Send for your copy today. Write: Anaconda American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.

G024

Architects: Belli and Belli, Chicago. Fabricator of grille: Greco Manufacturing Co., Chicago.



▼ **General view** of the altar and grille in St. Williams Church. The reredos is Venetian glass mosaic.

▲ **St. Williams Church, Chicago.** Pastor, Rt. Rev. Msgr. Paul F. Loeffel. A close-up view of the grille of circular design which provides a background for the altar screen. It is 46′ wide by 35′ high and made entirely of bronze. The circles are 3″, 6″, 9″, and 12″ in diameter, riveted together. The 3″ circles were cut from bronze tube. The larger diameters were roll-formed from standard rectangular bronze rod, ¼″ thick by 1″, 2″ and 3″ wide. After the circles were formed, the ends were joined by silver-alloy brazing. The outside of each circle was bright-finished and the inside painted with one of the five liturgical colors in pastel shades.

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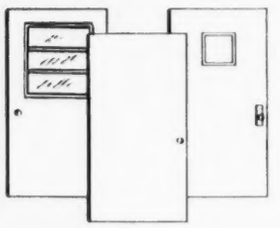

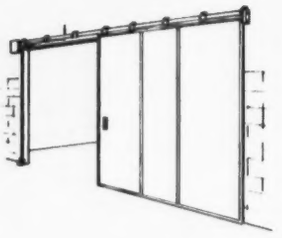

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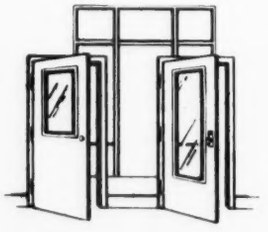
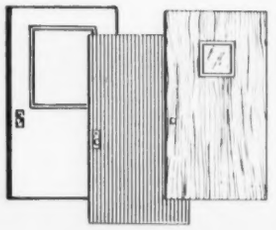


Plus



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LITERATURE

lignification, and microbiological attack—and tells how they can be discovered by inspection. Second part outlines corrective measures that can be taken to provide effective control of the three types of attack. Reprint is fully illustrated, and contains a diagram that points up potential locations of wood deterioration in cooling towers.
AIA FILE NO. 30-F-3
MFR: NALCO CHEMICAL CO.
Circle 334

PLASTIC ROOF VENTILATORS

Solid plastic roof ventilators for removing corrosive fumes are covered in Engineer Data Sheet *E-7801*. Upblast discharge blows fumes high into the air, minimizing corrosion to nearby roofs and ground areas, and reducing chances of fumes re-entering the plant. All exposed parts including the housing and impeller built of *Rigidon* plastic. Nothing to rust. Ten standard sizes, 400 C.F.M. to 15,000 C.F.M. (2 pp.)
AIA FILE NO. 30-D-1
MFR: HEIL PROCESS EQUIPMENT CORP.
Circle 335

MISCELLANY

INDUSTRIAL WATER SERVICE

Current brochure describes role of industrial water consulting service and discusses whole range of industrial water problems—from pretreatment to waste disposal—and highlights the necessity for proper water management to obtain lowest water costs. The booklet answers such questions as: "Why is water my most important raw material? Why can't I solve my own water problems? How much does consultation service cost?" Many examples of lower water costs are cited in booklet, as well as case history examples describing process improvements that resulted from more efficient use of industrial water. (24 pp.)
AIA FILE NO. 35-i
MFR: HALL LABORATORIES, DIV., HAGAN CHEMICALS AND CONTROLS, INC.
Circle 336

ELEVATOR EQUIPMENT

Information on elevator equipment for passenger and freight lifts is available in booklet *GEA-7095*. Booklet contains illustrations of complete line of direct-current variable-voltage equipment for geared and gearless elevator systems. It describes *Kinamatic* motor-generator sets which combine d-c generators of high overload capacity with matched breakdown torque a-c induction mo-

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HOLOFLUX® NO. 6434
in Offices of La Salle Casualty Co.

"...high level illumination without the usual painful glare"

Statement from Mr. Irving M. Addis, Architect, reporting on the illumination of new offices for La Salle Casualty Co., Chicago, Illinois.

"The lighting throughout the entire area is Holophane #6434 set into a flush mounted acoustical grid ceiling. The illumination level of 130 foot-candles was met without difficulty...The installation has proved to be extremely satisfactory from the decorative as well as illumination standpoint....Office personnel and management like the high level of illumination without the usual painful glare...Holophane is to be congratulated on the efficiency of the fixtures and the complete cooperation of its staff.

Irving M. Addis

Irving M. Addis, Architect

It is always gratifying to receive favorable notice of products or services...The compliments take on special significance when they come from knowledgeable sources....Added incentives to spur Holophane engineers toward new and higher areas of lighting achievement.

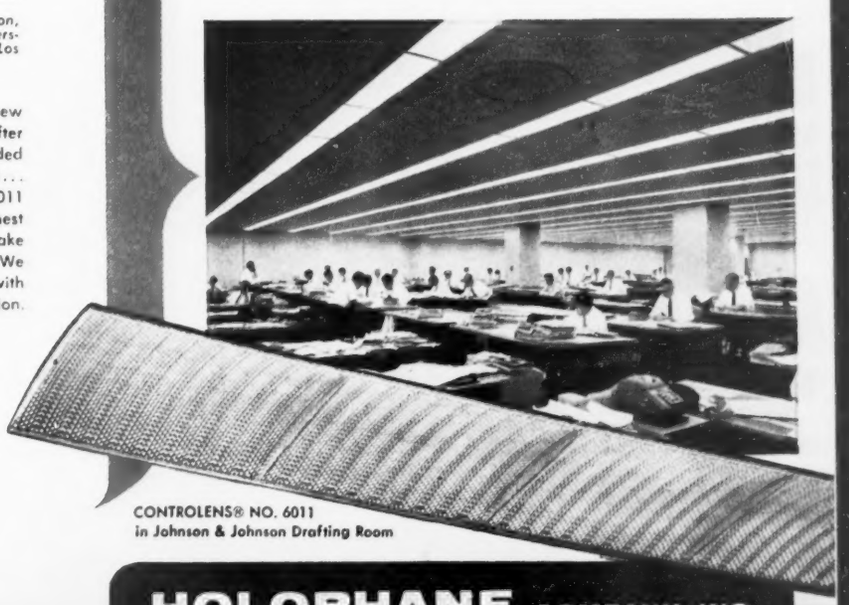
"We take pride in showing our clients our new offices"...

Excerpt from a letter by Mr. J. H. Johnson, President of Johnson & Johnson, Engineers-Architects, Inc., Chicago, Illinois and Los Angeles, California

We selected Holophane lenses for lighting our new offices and 9000 sq. ft. drafting room...After comparing several types of lighting we decided that a lens enclosed unit would be required...Further study proved that Holophane #6011 acrylic plastic Controlens provides the highest efficiency with precise control of glare...We take pride in showing our clients our new offices. We are particularly proud of our drafting room with 160 footcandles of uniform, glare-free illumination.

J. H. Johnson

J. H. Johnson, President



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LITERATURE

tors for variable-voltage power conversion. Also described are geared hoist motors with high peak commutation and Type GTE gearless hoist motors for high speed elevators with accurate leveling. (4 pp.)
AIA FILE NO. 33-G
MFR: GENERAL ELECTRIC CO.
Circle 337

3-IN-1 DIFFUSING ELEMENT

Three-in-one diffusing element is featured in addition to commercial fluorescent lighting fixture line. Shallow *Coronado* units have apparent depth of only 2½", which makes the line particularly adaptable to offices, schools, banks, and other interiors that require high quality illumination in attractive ceiling mounted lighting units. The three-in-one lens incorporates an *L-120* prismatic diffusing lens on the bottom, a linear refracting lens on the sides directing light of glare zone and refracting lens on top to eliminate ceiling hot spot. Complete specifications available in catalog.
AIA FILE NO. 31-F-24
MFR: THOMAS INDUSTRIES INC.
Circle 338

WOOD KITCHEN CABINETS

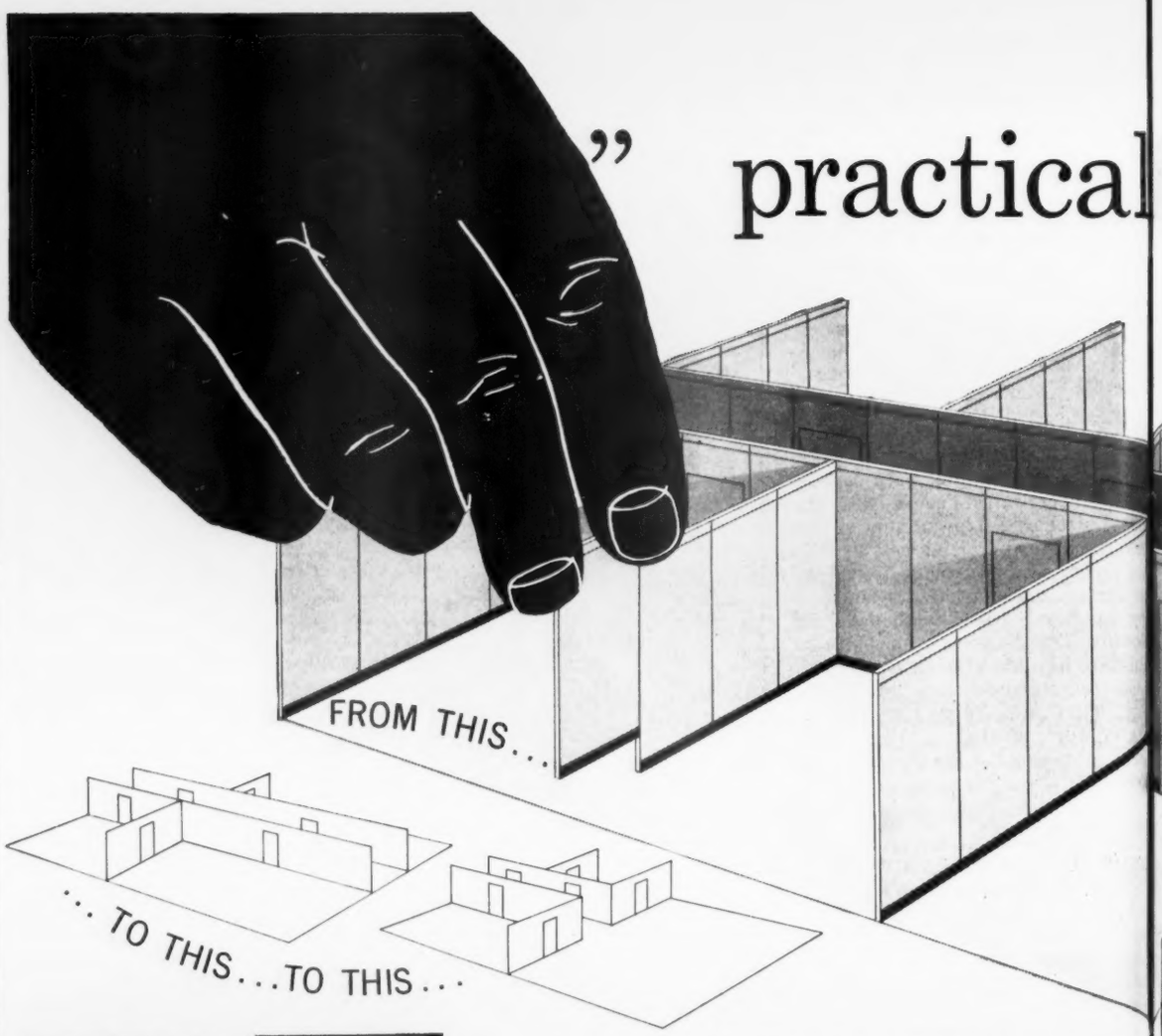
Catalog announces line of sectional wood kitchen cabinets. All doors in line are made of panels reconstructed wood, band edged with solid wood to provide strength as well as horizontal and vertical rigidity. Mortise and tenon construction throughout; shaped, molded hardboard drawers to minimize spilling; and special four-step finishing process on all exposed woods, are features of line. Mfr. stresses modest cost. (4 pp.)
AIA FILE NO. 35-C-12
MFR: GREEN RIVER CHAIR CO.
Circle 339

WOOD STAINING PRODUCTS

Recently published architectural file contains samples of heavy bodied stains, penetrating stains, stain waxes, redwood stain, cleartox, and bleachtox on actual wood samples. File gives necessary technical data for each type of stain. (30 pp.)
AIA FILE NO. 25-B-12
MFR: OLYMPIC STAINED PRODUCTS CO.
Circle 340

SAFETY ENCLOSURES

Safety enclosure catalog illustrates and describes line of glove, vacuum, and dry boxes; and controlled atmosphere systems for research and production purposes. Several pages are also devoted to illustrations of special enclosures and equipment made



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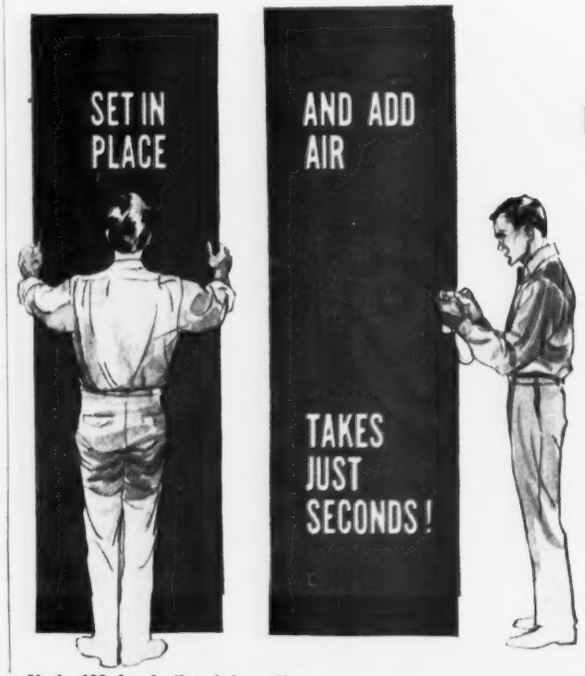

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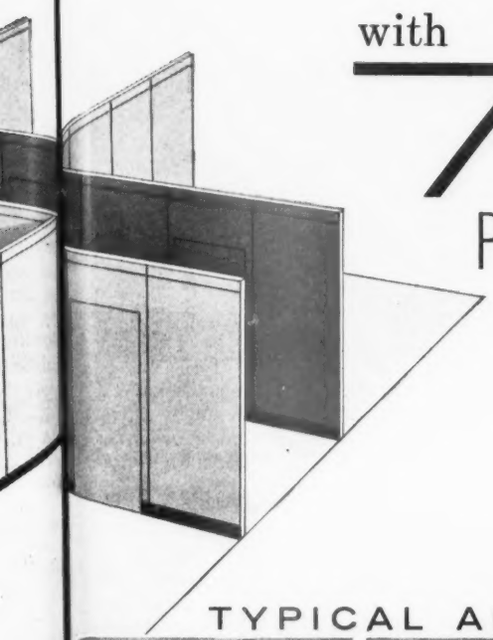
interior wall flexibility



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LITERATURE

to a particular customer's requirement. (32 pp.)
AIA FILE NO. 35-E
MFR: SCIENTIFIC EQUIPMENT DIV., KEWAUNEE MANUFACTURING CO.
Circle 341

LATCHSETS AND LOCKSETS

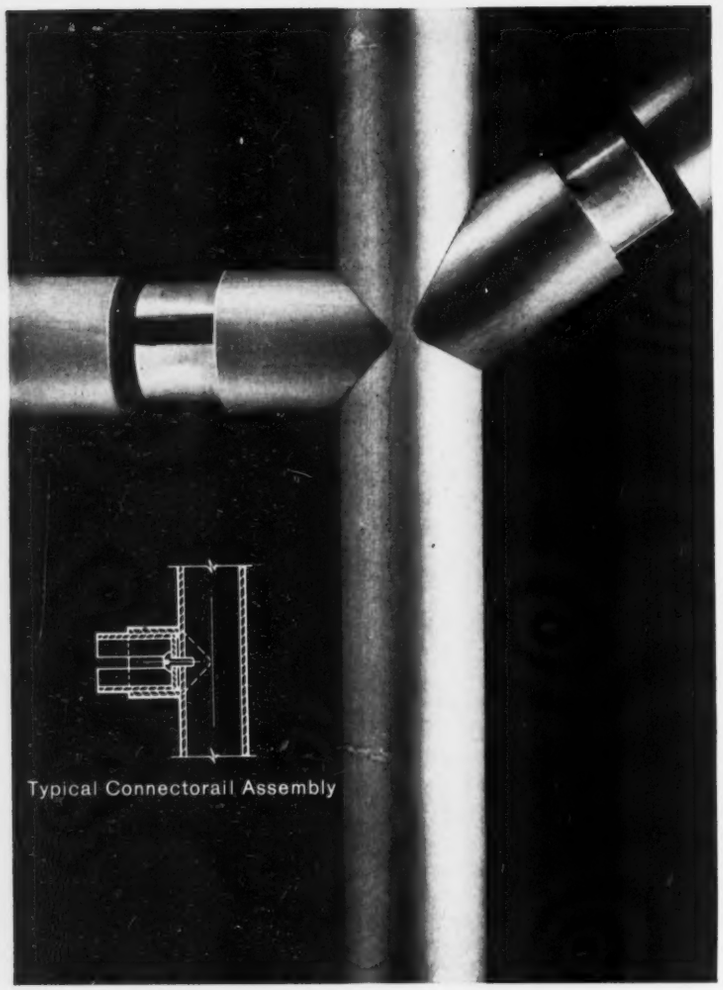
The availability of a new catalog section on bored locksets and latchsets is announced. Book contains information on the *MagnaLock* series of heavy duty architectural locksets and the *SentryLock* standard duty series. The new book replaces both the *MagnaLock* and the *SentryLock* currently in mfr's Architectural Catalog. (20 pp.)
AIA FILE NO. 27-B
MFR: SARGENT & CO.
Circle 342

LATH/PLASTER PARTITIONS

Fall edition of the *Metal Lath News* gives its entire issue over to the most modern applications of 2-inch solid partitions made of metal lath and gypsum plaster. Installation histories from various sections of the country are discussed and illustrated.
AIA FILE NO. 20-B-1
ASSN: METAL LATH MANUFACTURERS ASSN.
Circle 343

INDUSTRIAL LIGHTING

Lighting units for industrial assembly, sign boards and gymnasiums are included in *Industrial Incandescent Lighting*. Catalog diagrams and describes units for general lighting and specific industrial needs. Reflector holders, lampholders, lamp extensions and reducers also are illustrated. Detailed specifications are clearly explained, along with suggestions for usage of particular units, and various installation methods. First pages cover mfr's methods of seamless construction, finishing processes, and description of closed bead edges. (32 pp.)
AIA FILE NO. 31-F-21
MFR: BENJAMIN DIV., THOMAS INDUSTRIES, INC.
Circle 344



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NAMES

PHILIP WILL, FAIA A reserved, quiet spoken man, looking younger than his 54 years, Philip Will takes a strong, incisive approach in appraising the role of the architect and his professional society in America today. In addressing the membership of the American Institute of Architects shortly after his election as president, Will asked his colleagues to share his concern and conviction that the future is not a rosy panorama ahead of us, but that the future is "already with us—in crisis form." And that, "This crisis must be understood and dealt with if architecture is to continue as a vital profession of high stature and satisfying accomplishment."

Will proposes architects make up their collective mind that "ours is a broad mission, that ours is the responsibility for designing these second United States, and that the challenge is not just to anyone, but to us: The Profession of Architecture." Architects must face the problem of the total environment, he believes. "The image of the architect as the designer of the total environment, the masterbuilder, cannot be purchased or be created by mirrors or hidden persuaders. It must be earned by the professional conduct, the competence and the vision to deal with the complex problems of a future which is already upon us."

The professional role of the architect needs discussion, suggests Will. "For we should be, as I see it, a very disturbed and very troubled profession. We need, I believe, an earnest and searching reappraisal—yes, an agonizing reappraisal, perhaps—of the state of our profession, its performance, and its responsibilities." Stating that he can offer no panaceas—but rather that the AIA membership must engage in a re-examination of professional activities and conduct, Will believes that needed changes in "our professional approach and practice must begin with changed attitudes on the part of those who practice, teach and study architecture." He suggests the profession explore a new approach in three areas of professional life: *(1) We should search for a more encompassing, more comprehensive approach to the design of the total environment, an approach which might be called "architectural statesmanship;" (2) We should seek ways to broaden the scope of architectural services; and (3) We should recast the entire process of professional development from the guidance and recruitment of talented youth through education, training and licensing to post-graduate study and research.*

A partner in the firm of Perkins and Will of Chicago and New York, Will entered Institute work "by deliberate choice, simply because I found it interesting and challenging." His participation has carried him from positions as director, second vice president, and president, respectively, of the Chicago Chapter during the years of 1947 to 1954, to Institute offices on the national level. From 1956-1958 he served as second vice president of the Institute, and from 1958-1960 as first vice president. He was elected to the role of president this past April at the Institute's 92nd annual convention.

Will and his partner, Larry Perkins, met at Cornell where they were architectural students. The friendship continued after college, and the two men started their own firm in the mid-thirties. "We got odds and ends and worked our way up the hard way. We got our big break in 1939 with the Crow Island School [in collaboration with Eliel Saarinen]." Through the years the firm has achieved recognition for design through various awards including 11 national awards or medals, four local awards and 20 citations of merit. The major work of Perkins & Will is educational buildings, office buildings, and hospitals. But it also includes Will's constant plans and ideas towards professional teamwork in developing the well balanced community.

In his active schedule as AIA president and a private practitioner, Will tries to spend as much time as he can with his wife, Callie, and their children, Phip, 20, and Liz, 22, both students at Cornell. On holidays and vacations the Wills retreat to the contemporary glass-and-frame vacation house which he designed and had built at Higgins Lake, Mich.

BOOKS

Concrete Engineering Handbook *compiled by William S. La Londe, Jr., P.E., Editor-in-Chief, and Milo F. Janes, C.E., Assistant Editor. New York: McGraw-Hill Book Co., Inc., 1960. 1,216 pp., illus. $25.00.*

This new handbook by 20 specialists provides a comprehensive and up-to-date reference on design methods and data, for all types of concrete structures. Presents a wide range of material, including not only design methods for various types of structures, but also special resumes on structural theory, torsion, materials, and construction methods, many diagrams and tables, and other design aids. A large section is given to the design of buildings and their elements. In this section, tabular data has been conveniently brought together, including some especially prepared for this book. Tables are given to permit the selection of concrete slabs, beams, and footing, once loads or moments, shear, and choice of fiber stresses are known.

Technical Communication *by George Harwell. New York: The MacMillan Co., 1960. 332 pp. $5.00.*

Designed to meet the practical needs of anyone who must present technical material in a report, letter, article or speech. The techniques of organization and presentation in the book can be applied to any technical area. The first section gives the principles of good organization and clear, concise writing style. Subsequent chapter show how to effectively fit material into the forms that are most frequently used: how to write various kinds of letters; how to organize and put down on paper the seven basic types of reports; how to prepare and document technical articles; and how to give oral reports. Another chapter tells how to present tables, graphs and figures so that they can easily be understood. The appendix contains a concise manual of the rules of composition and a glossary of usage.

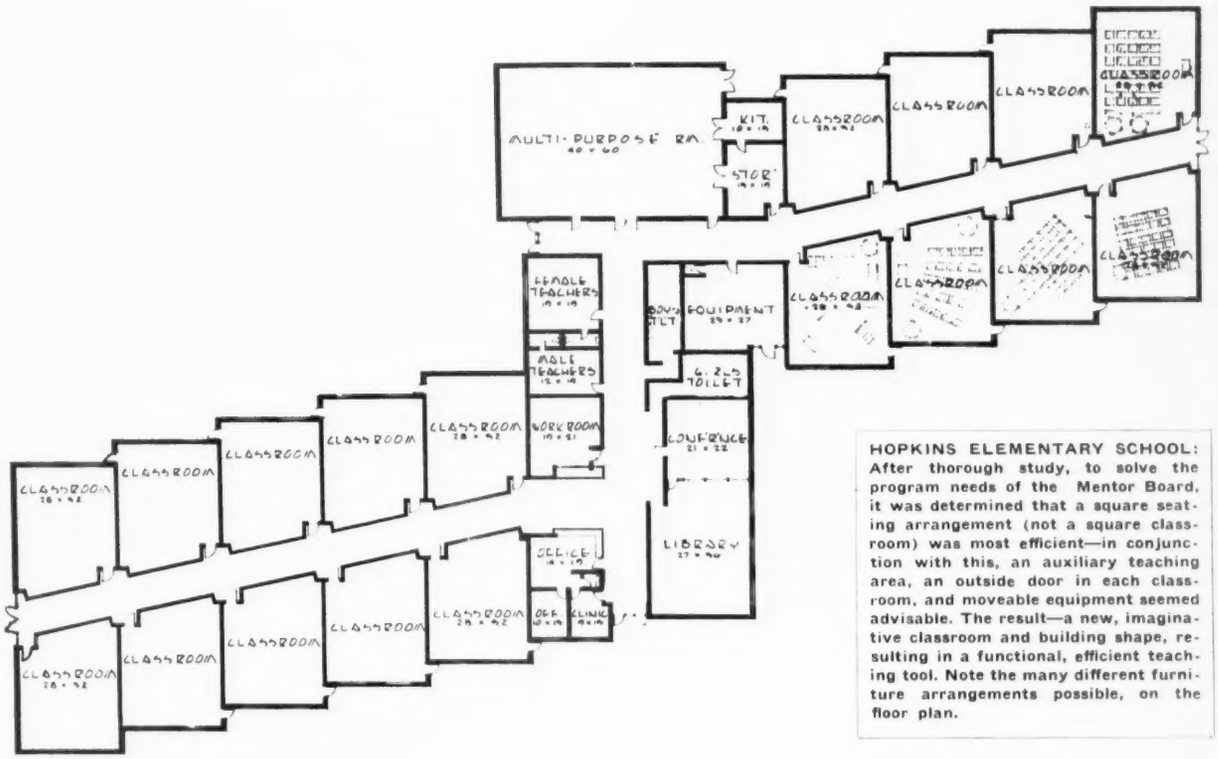
Estimator's General Construction Manhour Manual *by John S. Page. Houston, Tex.: Gulf Publishing Co., 1960. $10.00.*

Gives convenient method of estimating direct labor for complete general construction work in any given system, plant or location. The numerous manhour tables contain thousands of easy-to-use listings. The listings are guides to estimating manhours in every phase of general construction work. They are the result of hun-

(Continued on page 58)

DIGEST:24

HOW TO CUT DOWN INSTALLATION COSTS OF SCHOOL HEATING AND VENTILATION



HOPKINS ELEMENTARY SCHOOL: After thorough study, to solve the program needs of the Mentor Board, it was determined that a square seating arrangement (not a square classroom) was most efficient—in conjunction with this, an auxiliary teaching area, an outside door in each classroom, and moveable equipment seemed advisable. The result—a new, imaginative classroom and building shape, resulting in a functional, efficient teaching tool. Note the many different furniture arrangements possible, on the floor plan.

By D. R. Harper, C.E. Mr. Harper is a partner of the firm Harper & Stevenson, Consulting Engineers, Cleveland, Ohio. In this digest, Mr. Harper explains how heating and ventilating costs were minimized in a project which Harper & Stevenson acted as consultants on, the new Hopkins Elementary School at Mentor, Ohio.

Introduction

Consulting engineers are more and more frequently confronted with the problem of doing something about the steadily rising costs of mechanical installations. While architects have been bucking the trend of rising building costs by more careful selection of building materials and finishes, many consulting engineers seem to have remained too conservative in their designs and in the "safety factors" which they allow to compound.

For instance, it is still customary in many cases to calculate sizes of boilers and of other heating equipment by adding up the Btu requirements of all heating units and other devices of the system and by including safety factors all along the line. The result often is a selection of much larger sizes of boilers, pumps and piping than would be necessary if Btu requirements were calculated on the basis of actual heat loss.

It is obviously to the advantage of consulting engineers to write specifications that result in the lowest possible building costs without sacrificing quality. The trend toward more closely designed heating and ventilating installations has been spurred by the increasing competition among the various fuels. While some of the cost figures presented by the various fuel interests may have to be taken with a grain of salt, they nevertheless persuade the consulting engineer to study his own cost figures as closely as possible.

The trend toward mounting costs of mechanical work in building constructions—especially in heating and ventilating installations—was reversed in the new Hopkins Elementary School at Mentor, Ohio, which opened for the current year. Without sacrifice in quality, the designs resulted in a successful bid for a gas heating and ventilating system of $1.41 per square foot—well below the national average. The estimated fuel cost for one year in the 29,472 sq. ft. building is $2,770.00. Gas was selected over an electric system after close study of architectural requirements, installation costs, and estimated operating costs.

Contributing to lower installation and operating costs were these features: (1) Reduced boiler capacity and pump and pipe sizes because of "tight" calculation of heat demands; (2) Outdoor installation of piping; (3) Draft-neutralizing air distribution; and (4) Pressurized ventilation.

General program

Cost considerations loomed large in the design of the Hopkins Elementary School, designed by Bruce Huston & Architects Associated. The building itself is of somewhat unorthodox design. Its two main classroom wings have recessed brick walls. The architects hoped to achieve several benefits from this design.

The web-shaped classrooms, they felt, would allow a maximum flexibility in classroom and furniture use. About a dozen different furniture arrangements are possible. Each classroom has an outside door that does not infringe on window space. The interior classroom doors swing in a recess without endangering corridor traffic. A two-foot jog in each room permits convenient placement of a cabinet. The alcove created by the slanting wall and recess provides a more attractive interior than a square room, as well as space for an auxiliary teaching area or other related activities. The plan places all common rooms and teachers' facilities in a central location at the core of the building. Moreover, in spite of this imaginative architectural design, structural features are not complicated to add to the building costs. All corridor walls are nonbearing. Framing is from interior wall to interior wall at no greater cost than would be incurred with a square building.

DIGEST:24

Heat demand load

With the basic architectural requirements given, heat load calculations were begun, keeping in mind the need to keep installation and operating costs low. In establishing demand curves, it has been customary to arrive at a demand capacity by taking the sum of heat losses, ventilation air, temperature pick-up, piping losses, and ample safety factors at all points. However, in an effort to compete with their basically high-priced heating fuel, electrical interests in recent years have made a valuable contribution to the heating science with studies showing that the multiple safety factors in calculating demand load are unnecessary. Demand curves in electrically heated schools indicate that the peak demand is early in the morning when the school is without occupants and there is no ventilation load. No allowance need then be made for ventilation air other than infiltration into unoccupied rooms.

However, as a further step in economy, heat losses through ventilation air can also be disregarded when the school is occupied. It is assumed that the heat loss through ventilation equals approximately the input of heat from pupils and lighting load. The minimum rate of ventilation per pupil is assumed at about 6 cfm. Against this, the heat input per room is calculated as follows:

30 students x 225 Btu = 6,750 Btu
1,840 watts x 3.4 lighting = 6,100 "
12,850 Btu

$$\text{Btu} = \text{cfm} \times 1.085 \times \text{st°F}$$

$$\text{Total cfm} = \frac{12{,}850}{1.085 \times 70} = 168$$

$$\frac{\text{cfm}}{\text{student}} = \frac{168}{30} = 5.6 \text{ cfm per student}$$

Positive ventilation of classrooms

Only toilet rooms are equipped with powered exhaust fans. It is often assumed that exhaust fan capacity equaling air supply capacity is required. However, test results published in trade publications show that even when all room openings are taped and sealed, there is only a 10 per cent reduction in the outdoor air volume fed into the room by unit ventilator. This exfiltration can be accounted for by the porosity of concrete block and masonry. Assuming that normal room outlets and exhausts are available, it can be expected that the pressure of incoming air from a unit ventilator will provide complete ventilation. Therefore, in establishing ventilating needs for the Hopkins Elementary School, only a gravity exhaust above the corridor ceiling and grilles over coat racks were provided in lieu of powered exhaust and duct systems, with a corresponding reduction in cost of fans and duct work.

Air distribution

It has also been observed that in many instances extended radiation was adding heat to a classroom at the same time that a unit ventilator was cooling the room. The fuel consumption of a system employing such a control technique is obviously unnecessarily high. Since a unit ventilator fan must run in any case, it is considered more logical that the output energy of the fan motor should be the medium used to combat window draft—either by diffusion upward against such draft or by trapping draft through suction pressure. For the Hopkins Elementary School, unit ventilators were chosen with diffusion ducts at either side, extending over the full width of the outside wall.

Electricity vs. gas

With approximate heat requirements established, the question of fuel was considered. Because of the flood of newly published data on electric heating, serious consideration was given to electricity as an alternate fuel possibility to natural gas which is more widely used in Ohio. However, even before getting down to exact cost calculations, it became apparent that the architectural design was not considered particularly suitable by electrical experts. The many offsets of the building, in their opinion, would create excessive heat loss. A basically square building with special insulation was said to be ideal for electric heating.

While the architects would normally consider requirements of the heating plant as one of several design factors, they were not prepared to let the heating system be the dominant factor at the expense of other design features.

Heating and ventilating plant

After gas was decided upon, a system consisting of one hot water gas-fired boiler of 2,343,900 Btu output and hot water circulating pumps were chosen. Locating the equipment centrally resulted in minimum pipe sizes and reduced pump heads, and facilitated zoning. Each classroom has one unit ventilator with extended air ducts covering the window wall at sill height. Exhaust grilles are located above coat racks to remove odors of wet coats. Unit ventilator systems are installed in the multi-purpose room, library, offices, clinic and women teachers' lounge. There are exhaust fans in the toilet rooms, and a gravity type pressure relief exhauster serves the main corridor.

Pipe and pump sizes were reduced by use of a 40° F water temperature drop. Frequently, systems employ only 20° F drop and twice the volume of water must be handled by the piping and pumps.

Further economies were achieved by complete utilization of pump heads. Pipe sizes were maintained at a minimum to utilize maximum friction losses available, and yet stay below velocities that might create noise in the pipes. This meant, for instance, a 3 feet per second maximum speed for run outs and a 4 feet per second maximum speed for 2 inch pipe. Gas piping and other accessories could also be reduced accordingly.

Outdoor piping

The many offsets, doors and other obstacles to continuous piping runs under the casings of the building made it advisable to consider other installation techniques. Use of an outdoor trench system with a proprietary insulating material seemed to offer a ready solution to the problem. Although care must be taken to coordinate the installation with footer conditions and back fill schedules, there was a decided advantage for the piping contractor to work in open space with basically straight pipe line, except for a few offsets to accommodate expansion. Under normal circumstances, this should reduce labor costs as compared to indoor installations, while insulation costs may be somewhat higher.

Conclusion

It is hoped that the Hopkins Elementary School installation may serve as an illustration of the many items in a mechanical engineering installation that offer opportunities for economies. Increasing competition among different fuel interests and from other engineering branches should spur the consulting engineer to make competitive and cost considerations prime factors in his work.

Cost and area data

Total floor area—29,472 sq. ft.

	Total Contract Amount	Cost per sq. ft.
General trades	$172,255.00	$5.85
Plumbing	15,297.00	.52
Heating & Ventilating	41,650.00	1.41
Electrical	28,380.00	.96
Totals	$257,582.00	$8.74
	Total Building Contracts	Total Cost per sq. ft.

Cost per sq. ft.—total building cost—$8.74
Cost per class room—$14,310.11

Complete Budget—includes building costs, furniture, etc.

Building cost as above	$257,582.00
Site development—advance	38,621.10
Septic tank	9,500.00
Chalk boards	2,597.00
Allowance for furniture & equipment	35,000.00
Water line on street	1,200.00
Electric utility charge	600.00
Survey of property	350.00
Building permit	182.50
Misc. costs, contingencies, & architect fee (approx. $24,000 for misc. & contingencies)	44,367.40
Total Budget	$390,000.00

BOOKS

(Continued from page 57)

dreds of time-and-method studies, coupled with actual labor costs on numerous projects. Subject areas covered in 17 sections include: demolition; site-grading and structural excavation; concrete roadways; sheet and steel and mesh; miscellaneous embedded items; concrete; masonry; structural steel and miscellaneous items; carpentry and millwork; metal doors; sash glass and ceilings; roofing and siding; ornamental metal and special partition; and painting.

Economic Planning for Better Schools *by Benjamin Handler. Ann Arbor, Mich.: The University of Michigan, 1960. 107 pp., $5.00.*

Presents a comprehensive treatment of the entire problem of school plant planning. Deals factually and analytically with the following: useful life of school buildings; kinds of cities and regions which need additional schools; how school buildings can provide for child needs and educational developments; how can economies be achieved through architectural means; how can capital budgeting facilitate the effective use of resources.

Engineer's Vest-Pocket Book. *Baltimore, Md.: Ottenheimer Publishers, Inc., 1960. 192 pp. $.90.*

This handy, pocket-sized guide contains such information as: the formula for the Binomial Theorem; the properties of structural steel; the properties of saturated and superheated steam; the resistance immersed body moving through fluid; thermal stress; resistance; veniers, cost estimating; properties of minerals; chemical solubility; and many others in the collection of 250 main items and 47 important charts. There is an alphabetical index, an index of charts and tables, as well as 12 marginal indexed headings: mathematics, building, mechanics, heat, hydraulics, pipes, electricity, surveying, costing, mining, chemistry, and miscellaneous data.

Cathodic Protection *by Lindsay M. Applegate. New York: McGraw-Hill Book Co., Inc., 1960. 229 pp., illus. $9.00.*

A practical guide to cathodic protection from corrosion of underwater and underground structures. Descriptive in treatment, style is simple with the aim of instructing those who have not had previous experience in the art.

EDITORIAL

lue of single-performance code

recent statement by Professor Henry Charles rge, AIA, acting dean of the School of Architec- e at the University of Southern California elic- d our interest since we believe that the points it forth have broad application in other parts of nation.

Dean Burge declared that savings could be ef- ted by the use of a single-performance code for state—enough savings which conceivably could for California's Feather River water project. are told that each year the people of California, crafts and its businesses are wasting untold mil- s of dollars because of the "towering pile of over- ping, contradicting or duplicating building codes regulations."

As a basis for his arguments, Dean Burge cited Field Act, or Title 21, which is the building e governing the construction of public schools in ifornia.

This piece of legislation was enacted in the wake the California earthquake of 1933, Dean Burge erved. "Many school buildings failed in that thquake; this is true," the USC architecture dean d. "But so did many theaters, churches, and other lic buildings.

Nevertheless, we 'hit the panic button' and came with Title 21 which governs public schools—not ochial schools, private schools, Sunday schools, dancing schools.

Are private schools, churches, civic and commer- l buildings more or less safer than public schools ause of the Field Act? Shouldn't everyone be ally safe? After all, public health, safety, and lfare are the very basics on which codes are dicated.

Various building codes effective in California do even agree on basic fundamentals such as the ght of handrails, the allowable contents of pipes, the allowable loads which can be placed on iden- al trusses," Dean Burge continued.

Nevertheless: All these matters and similar ques- s and problems could be solved efficiently, eco- ically, and far more practically with a single e than with the thousands of conflicts and dupli- ions with which we must now deal."

In support of his contentions concerning the need a single performance code for construction, Dean rge recently authored and saw favorable action the California Council of The American Institute Architects on the following resolution:

In view of the serious, costly, and chaotic con- ions caused by the over-lapping and conflicting es presently in use in California, be it resolved t the California Council of the American Insti- e of Architects sponsor a program dedicated to e development of a single code for all buildings in e State of California."

The problem of the single-performance building de eventually must be resolved at the legislative el, the USC architectural dean believes. And so we—if we may add our small voice.

To this end, Dean Burge urges interested persons write to their respective legislators and to the A informing them of their views in this matter ich is so vital because of the exploding population California and the healthy growth of the state ich should result from such a population increase.

JJC

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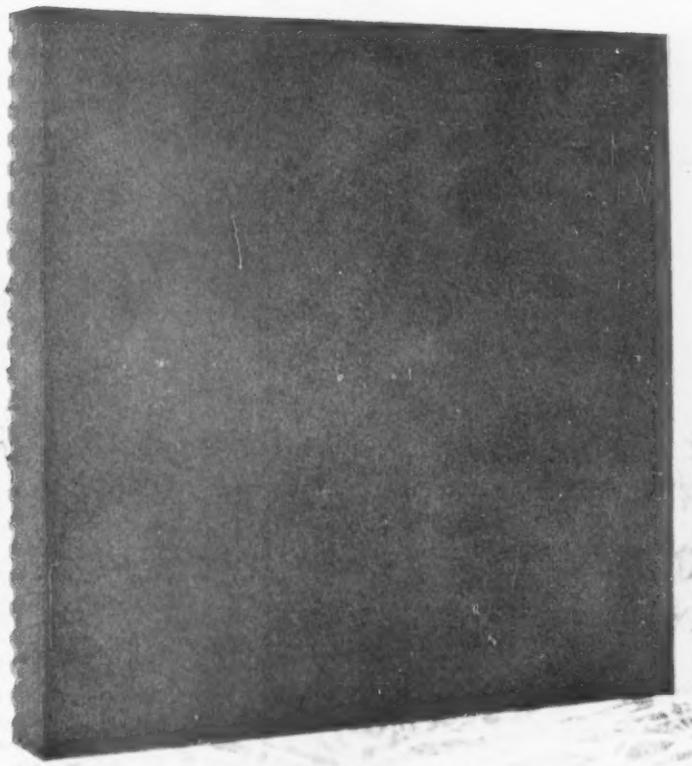

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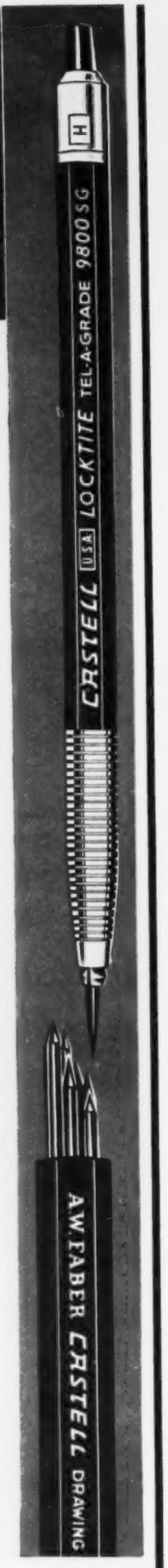

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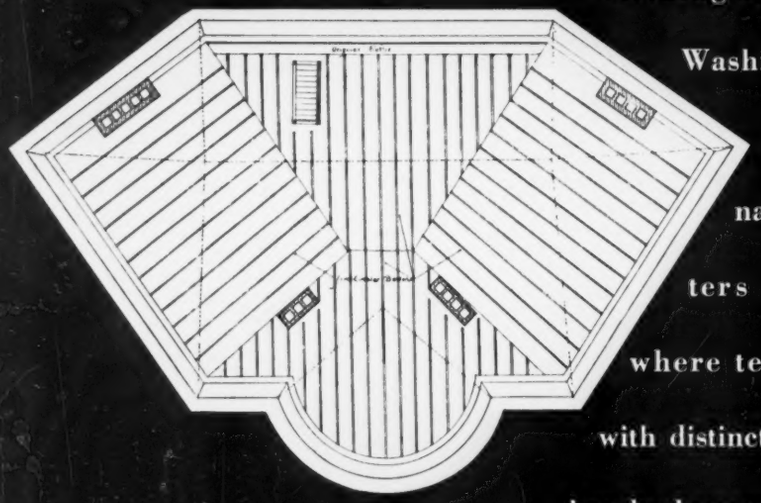

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